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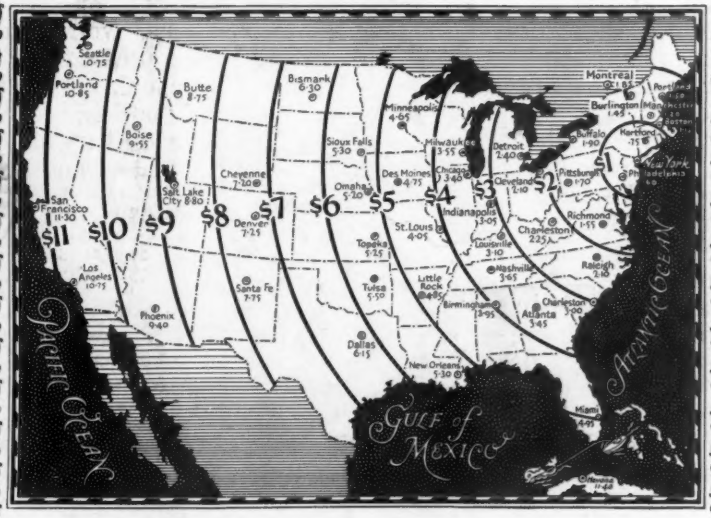

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Mr. Jac. Feinberg

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COTTON

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Cotton-Textile Institute Officers Hold Contact Conferences in the South

The Cotton-Textile Institute, Inc., last month assumed definitely more active proportions for the southern textile industry as a result of a contact tour made through that section by President Walker D. Hines and W. A. Gately, chief statistician. This followed a similar trip to several New England manufacturing centers by Mr. Hines and Secretary George A. Sloan, both trips being made primarily to permit these officers to become acquainted with the individual members and to give the members an opportunity to know these executives and learn first-hand of their activities thus far and their plans for the future.

President Walker D. Hines.

That the mill men who have joined the Institute intend backing up their membership with active cooperation was apparent from the large attendance of members which greeted the executives at the various meetings held in the South. The interest displayed, the many questions of vital importance to the industry, the harmonious discussions, the freedom and openness with which all spoke, clearly indicated that cooperative competition was passing the theoretical stage and coming into the state of actuality.

In his southern conferences, Mr. Hines explained that rather than attempt a cumbersome general organization alone, the plan of the Institute was to form groups, devoted to the various lines of goods. The first group, covering wide sheetings, was formed in the Institute's New York offices on March 4th, with H. R. Fitzgerald, president of the Riverside and Dan River Cotton Mills, Danville, Va., as chairman. The narrow sheeting groups was formed on the tour at the Atlanta meeting, with William J. Vereen, of Moultrie, Ga., as chairman, and the following members: Lee Rodman, Cannelton, Ind.; H. B. Jennings, Union, S. C.; V. M. Montgomery, Spartanburg, S. C.; J. C. Evins, Clifton, S. C.; Allen F. Johnson, Lynchburg, Va.; and Aug. W. Smith, Greenville, S. C.

Coming down from New York, Mr. Hines stopped first at Greensboro, where the first conference was held, under the direction of Mr. Fitzgerald. This meeting brought Mr. Hines in contact with the manufacturers of the Eastern North Carolina territory. It was held on Monday, March 7th. Here the first group organized—the wide sheetings group—was explained in detail. It was explained that attending its organization were members engaged in the manufacture of wide sheetings, sheets and pillow-cases, and the committee, headed by Mr. Fitzgerald, will seek to work out the problems of this particular group.

On Tuesday, March 8th, the second conference was held at Charlotte, N. C., the mill men from various sections of the Carolinas meeting with Mr. Hines. A large attendance of mill men was called to order by Stuart W. Cramer, vice-president of the Institute. After briefly explaining the purposes of the meeting, Mr. Cramer introduced B. B. Gossett, director of the Institute, who, with Mr. Hines, directed the discussion of the meetings. In this, as at the other meetings, Mr. Hines briefly indicated some lines of activity along which the Institute is thinking and workng. The following may be termed a brief summary of some of the points developed:

Secretary George A. Sloan.

Through the offices of the Institute, a well-organized campaign is being conducted with a view to increasing the consumption of cotton products. In connection with this, one of the first accomplishments was to influence the highway departments of the southern states to require cement to be shipped in cotton bags. These states are South Carolina, Georgia, Virginia, Alabama, Tennessee and Florida. An investigation disclosed that approximately 100,000,000 bags of cement annually are being shipped in paper bags,

and only approximately 20 per cent of that quantity can be used more efficiently when packed in paper bags than in cotton bags. This survey indicated that the manufacturers prefer to use cotton bags, which are suitable for repeated use after being shipped back to the factories. The custom of using paper bags is costing the cement users $500,000 annually, it was pointed out.

The study of possible additional uses of textile products will be carried into every industry, trade, profession and requirement, it was pointed out. The study also will extend to a comparison of relative values of cotton and other fibers, as well as the adaptability of cotton to new requirements. The latter phase of the work will be the distribution of the Institute's findings to the manufacturing industry and the trade and the coordination of efforts to put the findings into effect.

The effort of the Institute to coordinate the activities of the cotton manufacturers, will be the most comprehensive ever taken. One of the first movements will be to develop the machinery for gathering and disseminating data of importance to the industry. This information will include statistics on production, orders on hand, stocks, and world-wide market reports. This was the original purpose of the organization proposed by the initiators of the movement which resulted in the formation of the Institute. In addition, Mr. Hines explained on his southern trip, the standardization and simplification of products, wherever possible, to eliminate duplication; the evolution of a standard cost system for mills, where practicable; the extension of the use of cotton goods and the development of new uses and markets for cotton goods, including the furtherance of a greater export activity, all are included in the plans of the Institute.

The Institute will also interest itself in the production of cotton at least to the extent of an attempt to impress in various ways upon the farmers the importance of careful handling of the staple.

Inasmuch as Charlotte is in the yarn territory, largely, and this class of product is meeting the same problems which affect other groups at present, Mr. Hines indicated in his conference there that at an early date the spinners' associations would confer with him in New York through committees regarding trade and market conditions in their particular fields. The discussion evolved a general impression that the spinners would well profit by placing their problems openly and candidly on the tables of the Institute, and then, with their combined intelligence, mutual confidence, and the information obtained from the Institute, constructive plans could be made.

On Tuesday evening, the scene shifted down to Spartanburg, S. C., where the Chamber of Commerce, under the leadership of H. A. Ligon, president, and John A. Law, brought together a large group of business men to welcome Mr. Hines to Spartanburg and hear from him some of his hopes and plans for the solution of the industry's ills. This discussion was very wholesome in its reactions, as no economic problem exists which is not directly or indirectly related to other such problems. Mr. Hines, in his remarks, showed his insight into these inter-related problems, and left the impression that the directors of the Institute had wisely chosen its executive head.

On Wednesday, March 9th, at noon, at the Hotel Cleveland in Spartanburg, the cotton mill executives of the Spartanburg territory were called to order by J. C. Evins, president of the Cotton Manufacturers' Association of South Carolina. Mr. Evins, in introducing Mr. Hines, stressed the fact that while practically all classes of products are manufactured in the Spartanburg district, perhaps the principal products are print cloths, sheetings and fine goods. Much of the discussion at this meeting centered around these groups. Mr. Hines, in all of his discussions, made it clear that his idea on the trip was not to sell the Institute idea to the mill men; the idea was already theirs and they had asked him to help them express it. Therefore, his main reason for the trip, as he explained, was to hear from them further amplifications of the practical operation of the Institute. No one man, he pointed out, can solve the industry's problems; the cooperative effort of all affected by these problems is the key to the solution.

At the Poinsett Hotel in Greenville on March 10th, Captain Smyth, the dean of the southern industry, called the meeting to order at 12:00 o'clock. In introducing Mr. Hines, to the Greenville group of manufacturers, Captain Smyth set forth very clearly what he considered as some of the outstanding problems of the industry, which gave Mr. Hines a strong lead for a practical application of some of the fundamental principles that had been previously discussed. At the luncheon which followed, B. E. Geer of Greenville presided. Dr. W. J. McGlothlin, president of Furman University, gave the group an intimate personal appreciation of Mr. Hines. Mr. Geer made some characteristically brief but pointed remarks on the purpose of the meeting, and Mr. Hines outlined the general ideas predominating in the Institute. This was an open meeting, with prominent visitors in attendance. The afternoon session was presided over by J. P. Gossett, president of the American Cotton Manufacturers' Association. The discussion at this meeting to some extent resembled that of the previous conferences; however, new subject matter was developed at each meeting.

In Atlanta, at the Biltmore Hotel, on Friday morning, March 11th, George S. Harris, vice-president of the American Cotton Manufacturers' Association, called the mill men to order, and presented Mr. Hines, who followed his general line of introductory remarks, but rather emphasized group organizations, going particularly into the organization of the wide sheeting group. This trend was due to the fact that, as has been mentioned. the narrow sheetings group was formed at the afternoon session.

George A. Sloan, secretary of the Institute, was present at the Atlanta meeting, and gave a brief report of the activities of the Institute in seeking new uses for cotton, in cooperation with government agencies and in other directions.

Cooperation was stressed at the luncheon which followed this discussion. This luncheon was given by the Cotton Manufacturers Association of Georgia, with Mr. Hines as the guest of honor. Other guests present included Governor Clifford Walker and prominent bankers of Atlanta. Following the luncheon, the narrow sheetings group, as mentioned, was organized.

In summing up the effect of these contact meetings, it may be said that the cotton manufacturers are absolutely behind the Institute in its program; the Institute has a splendid picture of the needs and philosophy of the southern manufacturer, and with the Institute and manufacturers cooperating fully, a more continuously stable period for the textile industry is in sight.

Reactions expressed by the mill men following the meetings were practically unanimous in the feeling that, in addition to a cooperative spirit being exhibited by the manufacturers, the Insittute was being properly guided by an adequate executive. Mr. Hines is of the calm, reflective, scholarly type, with a remarkably analytical mind. Though undemonstrative, he evinced the keenest appreciation of the interest displayed by the southern manufacturers and of their expressions of confidence and cooperation. The earnest, direct manner in which he outlined his work and plans, and the eagerness with which he solicited the advice of the members, served to strengthen the feeling that his personality and experience fit him for his work. The energetic efficiency evident in the work of Mr. Sloan as secretary also received favorable comment.

The good-will and interest engendered, together with the contacts formed and the more definite understanding among all branches as to the plans and activities of the Institute, made the meetings well worth while to those attending, and invaluable, in their provision of background, information and contact, to the executive officers. The occasion of the joint convention of northern and southern manufacturers in Atlantic City on May 12th, 13th and 14th, will provide a further opportunity for contact and discussion of the Institute.

At the close of the southern trip, Secretary Sloan announced, on March 10th, that eight mills had just been added to the Institute's membership. Four of these are southern mills, and four are New England Mills, as follows: Dallas Cotton Mills Company, Dallas, Texas; Davis Mills, Fall River, Mass.; Esmond Mills, Esmond, R. I.; Hillsboro Cotton Mills, Hillsboro, Texas; Monticello Cotton Mills, Monticello, Arkansas; Monument Mills, Housatonic, Mass.; Patterson Mills Company, Rosemary, N. C.; and Stevens Mfg. Company, Fall River, Mass.

It is interesting to note that the addition of these mills makes a total of 438 members representing 484 mills, in the Cotton-Textile Institute, Inc. The Institute's membership now includes 21,350,000 spindles. Since October 20, 1926, when the first annual meeting was held, 22 new members have joined the Institute.

Snapped or Sledded Cotton in the Mill

The problems presented to mill men by the large amount of snapped or sledded cotton this season were discussed by F. Gordon Cobb in a talk before The Arkwrights, Inc., in Charlotte, N. C., on Wednesday, February 23rd. This organization is the new research and testing body formed by the Southern Textile Association members and Mr. Cobb is president. He pointed out the possibilities of research, through the Arkwrights body, in properly cleaning this cotton. Because of the pertinence of his remarks, and his explanation of the purposes of The Arkwrights, Inc., his remarks are reproduced in part.

F. Gordon Cobb.

Is referring to the leaders in the research and testing movement, Mr. Cobb pointed out that they are carrying on this work at great personal sacrifice and expense.

"Can you imagine a finer spirit of loyalty and broad-mindedness," asked Mr. Cobb, "when you realize that our sole object in forming the Arkwrights was the hope of not only helping our brother overseers and superintendents but to put an industry in which is invested hundreds of millions of dollars on a comparable basis, so far as standards and other specifications are concerned, with other great industries such as the automobile industry, steel industry, the cement industry and others.

"Practically all great industries are making large appropriations for research work, General Electric, Westinghouse and American Telephone and Telegraph are examples. The wonderful vitaphone is a recent result of years of research work.

"Although the art of weaving and making yarns is so old that history cannot trace its beginning, the textile industry is so young that we have been unable to get away from the habits of our fathers.

"Not so many years ago the 5,000 spindle mill was a large unit. I have seen in my day not 100 miles from this town a mill which brought its one bale of yarn to town each day in a one horse wagon and took the mail back. One man in this room now runs a large mill where that small yarn mill was located. A boss spinner who worked for me told me that his father was superintendent of that mill when they used to auction the yarn off. Country people and folks from nearby villages would come to the mill at intervals and the superintendent would get up on a box and sell the yarn to the highest bidder.

"In those not far distant times, one man was superintendent and acted as overseer of each department and as engineer, office man and everything—mills grew to 10,000 to 20,000 spindles and they had to put on overseers. They grew to 100,000 spindles and they had to still further expand and specialize the management.

"Although we have made wonderful strides in management we are still laboring under the handicap of the 'Habits of our Fathers.'

"The fact that we are creatures of habit is our one greatest handicap. A cow will walk around a tree on her way to the barn from the pasture—let the tree rot down and she will walk around the stump and when the stump is gone and the ground is perfectly smooth she will continue to walk around because she has always done so.

"We haven't progressed as we should because we haven't had the proper vision. Probably we haven't had the cooperation and possibly we haven't had the nerve to break away from those old habits, those old methods of manufacturing.

"Before the Arkwrights had systematized their work startling discoveries were made. After all the work we have done in the Southern Textile Association, in fact the Research Committee was probably more surprised than the average overseer and superintendent when research proved conclusively that it was useless, in fact, a detriment to use jack frames under certain conditions that many mills were using them.

"This bears out still further that we are creatures of habit. We are operating jack frames under certain conditions because we have always done so. Many mills will now save thousands of dollars per year as a result of that research work.

"One of the most vexing problems we have to combat

is the fact that the theoretical standards which have been set us will not work in practice. That was brought out very forcibly at our sectional meeting held at State College when we had both the theoretical and practical man in the same meeting.

"I repeat, we would like to have you see this work being carried on but we also realize that would be an imposition on your time, therefore, we will confine our work at this meeting to passing on a few tests that we are almost compelled to pass on but which will not take long because the detail work has already been done.

"There is, however, one very important matter I wish to merely mention for information because very soon everybody will be discussing it.

"We received a letter recently from the superintendent of one of the largest bleacheries in the South stating that they were having all kinds of trouble with some of the goods they are receiving, in getting it to bleach and dye without leaving streaks and spots in the goods.

"We have also received numerous inquiries from other sources regarding the same trouble. The most common complaint has been that the goods will not take the dye evenly. At any rate, something has happened that is giving bleachers and printers trouble.

"No doubt most of you are familiar with what is termed snapped and bolly cotton. The government has made exhaustive tests to prove to the farmer that it does not pay him to gather his cotton by this method, yet reports show that there have been several millions of bales of sledded cotton gathered from the past cotton crop.

"Formerly we only had the tail end of the crop to contend with as snapped cotton. Now the whole crops are being sledded because it can be gathered for about $2.50 per bale, making a saving to the farmer of $3.00 to $10.00 per bale and incidentally a loss to the mill of at least double that amount.

"We have proven conclusively that a mill running sledded cotton has more than one-third of its ends down on spinning caused by the bark which comes off the cotton stalk going through all the preparatory machinery and finally knocking the ends down on the spinning.

"In other words an operative can only attend two-thirds as many spindles where a mill is running sledded cotton as she can if the mill is running on the same grade of cotton which has been gathered in the regular way.

"An examination of a cotton stalk will show that even in pulling off the bolls you get long fibres of the bark mixed with the staple of the cotton. This bark is very strong and slick and the gins will not remove it, the vertical and horizontal openers will not remove it, three processes of picking will not remove it and neither will the process of carding remove it, therefore, something must be done with cotton mill machinery to meet this new method of gathering cotton.

"In studying the Government tests of snapped and sledded cotton we believe we have found something that is affecting bleaching and dyeing.

"It is a known fact that cotton fibers which are hollow do take dyes more uniformly than fibers which are flat, and micro-photographs show conclusively that snapped cotton is, in most every case, immature and therefore does not have the hollow fiber.

"In visits through mills I see evidence of snapped cotton—at the pickers, around the trumpets, on cards, on the guide boards, evidence of snapped cotton where mills do not even know they are using snapped cotton.

"In the Southern Textile Association we have worked for years trying to reduce the beating of cotton as much as possible, eliminating every beating process that it is possible to eliminate, for we realize and have known for some time that the more the cotton is beaten the weaker the fibers become, resulting in bad running work, higher costs, a larger percentage of waste and weaker yarns.

"Now it seems that the work we have been doing, the thousands of dollars we have saved the mills, the high quality and increased breaking strength of yarns we have been able to produce will be of little consequence if something is not done regarding the vast amount of snapped cotton that is gathered today.

"Snapped cotton is beaten to death before it ever reaches the mill. It is necessary that it receive this treatment in order to remove the leaves, sticks, stalk and bolls and in using such cotton no mill can expect anything in the way of high quality of product at low cost in comparison with product and cost from the use of low middling gathered in the regular way.

"It is true that with the improved opening and cleaning machines we are able to eliminate most of this trash and make a fairly clean piece of goods out of trashy Western cotton.

"The real thought, however, connected with sledded cotton is that in gathering this cotton by sleds it gathers up stalks and bolls; also in pulling bolls off the stalk oftentimes the bark of the stalk will skin off in long strips, and these long strips of bark from the cotton stalk cannot be taken out or separated from the ginned or lint cotton.

"The bark of the cotton stalk is composed of two layers as is the skin of a person. The bark or outer layer can be pulverized through the beating processes and the majority of this outer layer will come out in waste by the time the cotton leaves the cards.

"The inner layer, however, is a mass of long, slick, strong fiber as strong as sisal or jute, and as indicated, we have no machine whatever that will take these long fibers from the cotton, and most any mill man knows what will happen if he should tear up his cotton bagging and let it go in with his mixing of cotton.

"Now, not only does sledded cotton require more beating to remove the trash than does the same grade of cotton gathered in the regular way, but due to this excess beating or cleaning process the cotton fibers of sledded cotton are much weaker than are the fibers of cotton of the same grade gathered in the regular way.

"Then these long, strong, slick fibers of the inner layer of the bark which is found in sledded cotton cannot be removed by the gins, neither can they be removed by horizontal or vertical openers nor by any of the preparatory machinery, consequently these long fibers go through all the processes until they reach the spinning frame where they will not draw like fibers of cotton, and there knock the ends down.

"A number of tests on sledded cotton have shown that 30 to 40 per cent of the ends down were caused by the long, strong fiber of the inner layer of the bark which is present in the sledded cotton.

"Very likely this method of gathering cotton is in the West to stay, and will soon be in other parts of the cotton belt inasmuch as it means a saving to the farmer of from

$3.00 to $10.00 per bale, depending on the price of cotton.

"With the scarcity and high wages demanded by cotton pickers and when a bale of cotton can be sledded for about $2.50 (as reported from the West) you cannot blame a farmer for sledding cotton. Therefore, mills must meet the new conditions and as sledded cotton brings up a problem we have never had in cotton before many mills are running the cotton not knowing what it is costing them.

"Therefore you can see the necessity of immediately beginning to build up data to show the mill presidents and treasurers that they must not pay as much for snapped low middling cotton as they pay for low middling gathered in the regular way, and The Arkwrights expect to be able to make a report on this matter in the near future."

Carding Section Meets At Charlotte

by

Robert W. Philip

The Carding Division of the Southern Textile Association held a most interesting discussion meeting at the Manufacturers' club in Charlotte, N. C., on Wednesday, February 23rd. J. O. Corn, superintendent of the Pacific Mills, Columbia, S. C., who is chairman of the division, led the discussion in an able manner. The meeting was devoted mainly to the consideration of factors in the carding department having a bearing upon the breaking strength of yarn. Prior to this discussion Chairman Corn completed the compilation, begun at the previous meeting in Spartanburg, showing the practices of the men present as to various methods and operations in the carding department. At Spartanburg, the compilation was postponed practically when the drawing figures had been secured, and so at Charlotte the securing of the fly frame figures completed the information.

Since this report in COTTON was the only one published to contain the previous figures compiled at Spartanburg, and since the accompanying report of the Charlotte compilations is the only one to be published, sufficient space will be given to record the replies.

The method used in compiling the figures was to divide the men present into three groups, according to the range of numbers each man manufactured. All men making below 30s were placed in one group, those on 30s to 40s in another section, while those manufacturing 40s and finer yarns were in another group. The questions asked related to machine settings, speeds, drafts, twists, etc., as will be evident in the following summaries of the compilation.

Tabulation for Numbers Under 30s.

Slubbers.

The first question asked for hank rovings used, twist per inch, draft, and lays per inch. It developed that in this group, eight of the men present use below .50-hank roving. Three of these use .86 twist per inch. One has 5 lays per inch, five have 5½ to 6, and one reported 6¾ lays per inch. Nine of the men make between .50 to .60-hank roving for numbers in this group. One man in this group reported .94 twist per inch for his roving, and four of the men make 4 lays per inch. Five men make between .60 and .70-hank roving, four of them using 8 lays per inch. As to the draft, this was reported as follows, two men between 3.25 and 3.50; eight men between 3.50 and 4.00; seven men between 4.00 and 4.25; and one man between 4.50 and 5.00.

For front roll speeds for .50-hank roving and below, the following replies were made: two men 165 r.p.m.; eight men between 180 and 200 r.p.m.; one man 207 r.p.m.

As to roll settings, on 1-inch cotton, seven men reported 1½-inches front to second; six men reported 1¼-inch from second to back; while three men reported 1¼-inch plus for this setting.

The unit weight of full bobbins on a 12x6 slubber was next asked. Six men reported 44-ounce; two men less than 44-ounce; and five men more than 44-ounce.

Intermediates.

The intermediates for this group below 30s were next taken up. Hank rovings were reported as follows, two men below .80-hank; one man, .81 to .90-hank; five men, 1.00 to 1.10-hank; two men 1.11 to 1.20-hank; five men 1.20 to 1.40-hank; three men 1.40 to 1.60-hank; five men 1.60 to 2.00-hank, and two men above 2.00-hank. Only two men gave the twist per inch, this running between 1.30 and 1.40. As to draft, one man uses between 3½ and 4; six men between 4 and 4½; eleven men between 4½ and 5; and four men more than 5. One of the men making below 1.00-hank reported 8 lays per inch. Of those making between 1.00 and 1.50-hank, one reported 6 lays per inch, twelve reported 11 lays per inch, and one man 10 lays per inch. One man making between 1.50 and 2.00-hank reported 17 lays per inch and another reported 18. One man making above 2.00-hank reported 18 lays per inch.

Roll settings, for 1-inch cotton, were as follows: Front to second, eight men 1½-inch, two men 1¼-inch. Second to back, five men 1⅛-inch; four men 1¼-inch.

Unit weight of full bobbin on 9x4½ intermediate was reported as follows: five men 23-ounce; one man 20-ounce.

Speeders.

Next came the speeders. The reports on hank roving were: six men below 2.00-hank; three men between 2.00 and 2.50-hank; two men between 2.50 and 3.00-hank; three men between 3.50 and 4.00-hank; three men between 4.50 and 5.00-hank; three men between 5.00 and 5.50-hank; two men between 5.50 and 6.00-hank. One man reported twist per inch, 2.07. The drafts varied as follows: three men 5 to 5½; thirteen men 5½ to 6; four men 6 to 6½; and three men above 6½.

Front roll speeds for the speeders were reported as follows: one man less than 100 r.p.m.; seven men between 100 and 120 r.p.m.; six men between 120 and 140 r.p.m.; three men between 140 and 160 r.p.m.; two men between 160 and 180 r.p.m.

As to roll settings on 1-inch cotton, there were no variances reported: For front to second, eight men reported 1¼-inch, and for second to back, 1⅛-inch, no other settings being reported in this group.

As to the unit weight of full bobbin on a 8x4 speeder, two men said 15-ounce and two men said 14-ounce.

Tabulation for 30s to 40s.

Slubbers.

The figures compiled in this group will be given slightly differently from those in the preceding group, since in this tabulation, most of the information concerned was secured for each hank roving reported, where this had a bearing.

One man reported .62-hank roving, with .89 twist per inch; 4.03 draft, 6.81 lays per inch; roll settings front to second, 1 3/16-inch, second to back, 1½-inch; 1-inch cotton, 235 r.p.m. front roll speed.

One man making .63-hank roving, reported 1.02 twist per inch; 4.92 draft; roll settings, front to second 1¼-inch, second to back 1½-inch; 1-inch cotton; 178 r.p.m. front roll speed; 6.33 lays per inch; 40-ounce unit weight of full bobbin.

The continuance of this compilation is found below according to the hank roving made.

.65-hank roving—.96 twist per inch; 4.21 draft; 7 lays per inch; roll settings front to second 1 3/32-inch, second to back 1½-inch; inch-plus cotton; 175 r.p.m. front roll speed; 2.17 pounds unit weight of full bobbin.

.66-hank (cork rolls)—1.04 twist per inch; roll settings, front to second 1 3/16-inch; 15/16-inch cotton; 180 front roll speed; 2½ pounds unit weight of full bobbin.

.69-hank—1.089 twist per inch; 4.60 draft; 7.8 lays per inch; roll settings front to second 1¼-inch; second to back 1 9/16-inch; 1 1/32-inch cotton; 164 r.p.m. front roll speed; 44-ounce unit weight of full bobbin.

.74-hank—1.15 twist per inch; 4.80 draft; 7.5 lays per inch; roll settings front to second 1 9/32-inch, second to back 1 7/16-inch; 1-inch cotton; 168 r.p.m. front roll speed; 2 pounds unit weight of full bobbin.

.75-hank—1.02 twist per inch; 4.90 draft; 7.5 lays per inch; roll settings front to second 1¼-inch, second to back 1½-inch; 1-inch cotton; 157 r.p.m. front roll speed; 2.4 pounds unit weight of full bobbin.

.75-hank—1.10 twist per inch; 4.04 draft; 8 lays per inch; roll settings front to second 1 3/16-inch, second to back 1 7/16-inch; 1 1/32-inch cotton; 158 r.p.m. front roll speed; 2½ pounds unit weight of full bobbin.

.79-hank—1.25 twist per inch; 4.28 draft; 8.09 lays per inch; roll settings front to second 1 11/32-inch, second to back 1 11/32-inch; 1-inch cotton; 165 r.p.m. front roll speed; 2 pounds unit weight of full bobbin.

The foregoing refer to slubber roving for warp or for slubber roving where the same hank is made for both warp and filling all made on 11x5½ or 12x6 frames. However, one man reported two hank rovings for filling only, and his figures were:

.73-hank for filling—1.06 twist per inch; 4.78 draft; 7.5 lays per inch; roll settings front to second 1¼-inch, second to back, 1½-inch; 1-inch cotton; 40-ounce unit weight of full bobbin, 12x6 frame.

.83-hank for filling—.99 twist per inch; 4.96 draft; 8.1 lays per inch; roll settings, front to second 1 3/16-inch; second to back 1½-inch; 1-inch cotton; 195 r.p.m. front roll speed; 26-ounce unit weight of full bobbin, 10x5 frame.

Intermediates.

The figures for the intermediates in this 30s to 40s group will be given in the same way. The first figures refer to warp intermediate roving.

1.68-hank—1.55 twist per inch; 5.20 draft; 165 r.p.m. front roll speed; 1¼ front roll setting; 20 ounces unit weight of full bobbin on 9x4½ frame.

1.70-hank—1.69 twist per inch; 5.39 draft; 144 r.p.m. front roll speed; 1¼-inch front roll setting; 30-ounces unit weight of full bobbin on 10x5 frame.

1.80-hank—1.62 twist per inch; 5.62 draft; 12 lays per inch; 185 r.p.m. front roll speed; front roll setting 1 3/32-inch; inch-plus cotton.

1.80-hank—1.79 twist per inch; 5.80 draft; 15 lays per inch; 174 r.p.m. front roll speed; 1¼-inch front roll setting.

2.00-hank—1.80 twist per inch; 5.31 draft; 14 lays per inch; 135 r.p.m. front roll speed; 1¼-inch front roll setting; 1-inch cotton; 1½-pound unit weight of full bobbin on 10x5 machine.

2.00-hank—1.84 twist per inch; 5.47 draft; 140 r.p.m. front roll speed; 15/16-inch cotton.

2.14-hank—1.91 twist per inch; 5.44 draft; 14 lays per inch; 109 r.p.m. front roll speed; front roll setting 1 3/32-inch; 1-inch cotton; 26-ounce unit weight of full bobbin, 10 x 5 machine.

2.10-hank—1.15 twist per inch; 5.67 draft; 17½ lays per inch; 122 r.p.m. front roll speed; 1 3/16-inch front roll setting; 1-inch cotton; 20-ounce unit weight of full bobbin.

The man making a separate filling intermediate roving reported 2.10-hank and 2.20-hank, with a twist of 1.82 and a draft of 5.30 for the latter.

Filling Speeders.

6.50-hank—4.09 twist per inch; 6.16 draft; 35 lays; 102 r.p.m. front roll speed; 1¼-inch front roll setting; 1-inch cotton; 8-ounce unit weight of full bobbin, 7x3 speeder.

6.62-hank—3.74 twist per inch; 7.50 draft; 32 lays; 97 r.p.m. front roll speed; 1 1/16-inch front roll setting; inch-plus cotton; 8-ounce unit weight of full bobbin; 7x3 speeder.

6.75-hank—4.4 twist per inch; 6.66 draft; 34 lays; 93 r.p.m. front roll speed; 1¼-inch front roll setting; 1 1/16-inch cotton.

6.80-hank—3.95 twist per inch; 7.50 draft; 29 lays; 92 r.p.m. front roll speed; 1 3/16-inch front roll setting; 1 1/16-inch cotton; .524 pound unit weight of full bobbin, 5x3 speeder.

7.00-hank—3.95 twist per inch; 6.60 draft; 29 lays; 104 r.p.m. front roll speed; 1⅛-inch front roll setting; 1-inch cotton; 6-ounce unit weight of full bobbin, 6x3 speeder.

7.00-hank—4.08 twist per inch; 7.00 draft; 29 lays; 98 r.p.m. front roll speed; 1 3/32-inch front roll setting; 1-inch cotton; 8-ounce unit weight of full bobbin, 7x3 speeder.

7.00-hank—3.97 twist; 85 r.p.m. front roll speed; 1⅛-inch front roll setting; 1-inch cotton; 8-ounce unit weight of full bobbin.

7.25-hank—4.13 twist per inch; 6.82 draft; 32 lays per inch; 85 r.p.m. front roll speed; 1 3/16-inch front roll setting; 1-inch cotton; 8-ounce unit weight of full bobbin; 7x3½ speeder.

7.30-hank—3.74 twist per inch; 6.49 draft; 38 lays per inch; 94 r.p.m. front roll speed; 1 3/16-inch front roll setting; 1-inch cotton; 8-ounce unit weight of full bobbin; 7x3 speeder.

7.30-hank—4.45 twist per inch; 7.00 draft; 35 lays per inch; 92 r.p.m. front roll speed; 1 3/32-inch front roll setting; 1-inch cotton; 11-ounce unit weight of full bobbin; 7x3½ speeder.

7.50-hank—3.93 twist per inch; 7.43 draft; 39 lays per inch; 88 r.p.m. front roll speed; 1⅛-inch front roll setting; 1 1/32-inch cotton; 10-ounce unit weight of full bobbin; 7x3 speeder.

8.00-hank—4.28 twist per inch; 7.44 draft; 42 lays per inch; 86 r.p.m. front roll speed; 1⅛-inch front roll setting; 1-inch cotton; 8-ounce unit weight of full bobbin; 7x3 speeder.

Warp Speeders.

4.95-hank—3.09 twist; 5.86 draft; 26.6 lays per inch; 110 r.p.m. speed of front roll; 1 5/32-inch front roll setting; 1-inch cotton.

5.00-hank—3.26 twist per inch; 5.88 draft; 29 lays per inch; 120 r.p.m. speed of front roll; 1¼-inch front roll setting.

5.10-hank—3.23 twist per inch; 5.62 draft; 25 lays per inch; 106 r.p.m. front roll speed; 1 3/32-inch front roll setting; inch-plus cotton.

5.25-hank—3.39 twist per inch; 5.80 draft; 110 r.p.m. front roll speed; 1 3/16-inch front roll setting; 1 1/16-inch cotton.

5.35-hank—1.35 twist multiple; 6.45 draft; 27 lays per inch; 109 r.p.m. front roll speed; 1⅛-inch front roll setting.

5.40-hank—3.00 twist per inch; 5.14 draft; 32 lays per inch; 123 r.p.m. front roll speed; 1 3/32-inch front roll setting; 1-inch cotton.

5.60-hank; 1.50 twist multiple; 5.60 draft; 26 lays per inch; 103.6 r.p.m. front roll speed; 1 3/32-inch front roll setting; 1-inch cotton.

5.76-hank—3.26 twist per inch; 5.45 draft; 30 lays per inch; 106 r.p.m. front roll speed; 1 9/32-inch front roll setting; 1-inch cotton.

5.95-hank—3.39 twist per inch; 6.47 draft; 32 lays per inch; 111.5 r.p.m. front roll speed; 1 3/16-inch front roll setting; 1-inch cotton.

6.00-hank—3.75 twist per inch; 6.20 draft; 28 lays per inch; 102 r.p.m. front roll speed; 1¼-inch front roll setting; 15/16-inch cotton.

6.00-hank—3.95 twist per inch; 5.80 draft; 30 lays per inch; 103 r.p.m. front roll speed.

6.10-hank—3.64 twist per inch; 6.10 draft.

6.10-hank—1.35 twist multiple; 6.00 draft; 100 r.p.m. speed of front roll; 1⅛-inch front roll setting; 1-inch cotton.

Tabulation for 40s and Above.

Slubbers.

The information on the finer yarn started with the slubbers, this compilation being given for each hank roving reported as follows:

.50-hank—.85 twist per inch; 3.3 draft; 7.5 lays per inch; 1¼-inch front roll, 199 r.p.m.; dimension of full bobbin, 11x5½.

.55-hank—.71 twist per inch; 3.45 draft; 6 lays per inch; 1 3/16-inch front roll, 215 r.p.m.; dimension of full bobbin, 12x6.

.60-hank—.84 twist per inch; 4.03 draft; 7 lays per inch; 1 3/16-inch front roll, 180 r.p.m.; dimension of full bobbin, 11x5½.

.60-hank—.77 twist per inch; 3.84 draft; 7.10 lays per inch; 1 3/16-inch front roll, 182 r.p.m.; dimension of full bobbin, 11x5½.

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.65-hank—.76 twist per inch; 3.84 draft; 7.70 lays per inch; 1¼-inch front roll, 223 r.p.m.; dimension of full bobbin, 11x5½.

.70-hank—1¼-inch front roll, 170 r.p.m.; dimension of full bobbin, 11x5½.

.70-hank—dimension of full bobbin, 10x5.

.85-hank—1.25 twist per inch; 4.00 draft; 1¼-inch front roll, 184 r.p.m.; size of full bobbin, 11x5½.

.90-hank—1.08 twist per inch; 4.48 draft; 10 lays per inch; 1¼-inch front roll, 130 r.p.m.; dimension of full bobbin, 11x5½.

Roll settings in this group were not given according to the different hank rovings, but for different lengths of cotton. Four men reported using 1¼-inch cotton with the following different roll settings on slubbers:

Front to Second	Second to Back
1 9/16-inch	1⅝-inch
1 7/16-inch	1 11/16-inch
1 5/16-inch	1⅝-inch
1½-inch	1 9/16-inch

One man using 1⅛-inch cotton reported the following set-

tings: Front to second, 1 7/16-inch; second to back, 1⅞-inch.

The unit weight of full bobbin was given according to the size of the bobbin. On the 11x5½ bobbin, the following figures were given, each weight representing the report of an individual mill: 33-ounce, 41-ounce, 32-ounce, 32-ounce, 38-ounce, 39-ounce. The one man making a 12x6 bobbin reported a weight of 40-ounce.

Intermediates.

The twist per inch and lay per inch were given for the different hank rovings reported on intermediates, the drafts being reported without reference to the hank. The figures were:

1.40-hank—1.18 twist per inch, 12 lays per inch. 1.40-hank—1.22 twist per inch. 3.00-hank—1.65 twist per inch. 1.28-hank—1.04 twist per inch, 10 lays per inch. 1.25-hank—1.3 twist per inch, 11 lays per inch. 1.40-hank—13 lays per inch. 1.54-hank—1.24 twist per inch, 12.30 lays per inch. 2.50-hank—1.62 twist per inch, 15.00 lays per inch. The drafts for intermediate roving reported were as follows, each figure representing the report of one man: 5.00, 3.86, 4.66, 5.00, 4.00, 5.41, 6.00, 5.80.

Two front roll speeds, 194 r.p.m. and 165 r.p.m. were reported for 1 3/16-inch rolls. The 1¼-inch roll speeds were as follows, each figure representing the report of one man, 158 r.p.m., 177 r.p.m., 132 r.p.m., 138 r.p.m., and 122 r.p.m.

Roll settings on 1¼-inch cotton were:

Front to Second	Second to Back
1½-inch	1 9/16-inch
1½-inch	1 11/16-inch
1 7/16-inch	1 9/16-inch
1 5/16-inch	1⅝-inch
1⅝-inch	1 21/32-inch

One man, using 1⅛-inch roll, reported the following settings: Front to second, 1⅜-inch; second to back, 1½-inch.

Unit weights of full bobbins, for 9x4½ bobbin, were reported as follows, each figure representing the report of one man: 25-ounce, 21-ounce, 32-ounce, 22-ounce, 18-ounce. On a 10x5 bobbin, one report was made, 27-ounce.

Warp Speeders.

The following hank rovings, with the corresponding twists per inch and lays per inch, were reported in this group for the warp speeders: 4.00-hank roving—2.14 twist per inch; 22½ lays per inch. 3.19-hank—1.73 twist per inch; 15½ lays per inch. 3.50-hank—2.01 twist per inch; 13 lays per inch. 4.10-hank—2.26 twist per inch; 20 lays per inch. 3.75-hank—2.43 twist per inch; 23 lays per inch. 8.55-hank—3.40 twist per inch. 10.53-hank—4.2 twist per inch.

The drafts reported were as follows, each figure representing the report of one man: 5.70, 5.71, 5.00, 6.00, 5.49, 4.25, 8.00.

Front roll speeds, for 1¼-inch roller, were given, each figure representing the report of one man: 78 r.p.m., 135 r.p.m., 174 r.p.m., 150 r.p.m., 139 r.p.m., 124 r.p.m., and 86 r.p.m.

Five men using 1¼-inch rollers reported the roll settings as follows:

Front to Second	Second to Back
1 7/16-inch	1 9/16-inch
1½-inch	1½-inch
1 5/16-inch	1⅝-inch
1 9/16-inch	1 11/16-inch
1 11/16-inch	1⅝-inch

One man using a 1⅛-inch roller reported: Front to second, 1¼-inch, second to back, 1 7/16-inch.

On 8x4 bobbins, one report of the unit weight of full bobbin was 16-ounce; another, on 8x3½, 13-ounce; and on 7x3½, three reports were made, 10-ounce, 12-ounce, and 16-ounce

Jack Frames.

The hank roving, twist and lay reports for jack frames were: 11.49-hank roving—4.36 twist per inch, 39 lays per inch. 10.20-hank—4.08 twist per inch, 37 lays per inch. 10.50-hank—4.08 twist per inch, 38 lays per inch. 14.00-hank—4.62 twist per inch, 45 lays per inch. 10.53-hank—3.86 twist per inch, 49 lays per inch.

Drafts were, 5.25, 6.00, 6.00, 8.00, 7.00, and 6.41.

One man, using a 1 1/16-inch roll, reported a front roll speed of 102 r.p.m. Five others, using the 1⅛-inch roll, gave the following, 89 r.p.m., 93 r.p.m., 109 r.p.m., 80 r.p.m., and 100 r.p.m.

Four roll settings, on 1¼-inch roll, were

Front to Second	Second to Back
1 7/16-inch	1 11/16-inch
1½-inch	1 9/16-inch
1½-inch	1 9/16-inch
1 5/16-inch	1 17/32-inch

One man, on 1⅛-inch rolls, reported, front to second, 1 5/16-inch; second to back, 1½-inch.

On 6x2½ bobbin, unit weights of full bobbins reported were as follows, each figure representing the report of one man: 6-ounce, 6-ounce, 5 1/3-ounce, 7-ounce, and 5-ounce. Two men on 6x3 bobbin reported 8-ounce each.

Discussion on Breaking Strength.

When the compilation of the foregoing data had been completed, Chairman Corn announced that the meeting would go into practical discussion, and introduced a new method of conducting this feature of the meeting. Instead of presenting a prepared list of questions, he drew out those present on subjects of interest, and proceeded to discuss these, and there was no time during the meeting when the discussion lagged.

Reminding the carders that the purpose of the card room is, of course, to prepare the stock in such a manner as to be able to spin smooth yarn, strong yarn and even yarn, Mr. Corn said that at previous meetings "we have discussed things which govern all three of these points," and announced that he wanted to devote this meeting to those factors in the carding department which in any way exert an influence on the breaking strength of yarn. He called for suggestions as to these factors, and among those suggested were the following:

Heavy carding; beats per inch; roll settings; roll speeds; tension; lay; twist; draft; different diameter bobbins; condition of rolls; card settings (feed plate to licker-in and flats); rolls not properly oiled and cleaned; worn out card clothing; distribution of reworkable waste; humidity; improper creeling of cards and drawing and slubbers; speed of drawing rolls; tension of drawing; break draft of drawing; piecing up ends too quickly after stripping; excessive speeds; uneven laps; flutes in feed roll on pickers not kept clean, giving uneven feeding; setting of beater to the feed roll; draft on pickers; dull beater blades; improper lapping of laps behind the picker; evener motion belt slipping; bad licker-in; bad skewers on fine frames; damaged screen on cards; drawing spoons failing to rise properly; imperfect pressers on fly frames; flyers out of balance; steel rolls loose and worn; trumpets on drawing

and cards worn out; improper size trumpets on slubbers; eccentric on steel roll.

Mr. Corn announced that he would take these things up one at a time, and starting with "Heavy Carding," asked what should be done in this connection to maintain or improve breaking strength.

Card Production.

"Reduce the production of the card, slowing down the doffer and maintaining the same cylinder speed, feeding heavy, carding light," was the reply of J. V. McCombs, superintendent, Randolph Mills, Inc., Franklinton, N. C.

"Well, Mr. McCombs," responded the chairman, "on 30s and 40s yarns what do you consider would be the proper weight to get the breaking strength? What draft on the cards would you run?"

J. A. Chapman, Jr.

"112," replied Mr. McCombs, answering further that he would card between 90 and 110 pounds a day.

"Has anybody changed the card draft and gotten better results in breaking strength?" asked Mr. Corn.

"Yes," replied James A. Chapman, Jr., vice-president Inman Mills, Inman, S. C. "We changed from 125 to 110 and got better breaking strength. I went to 100, but had to go back to 110 to keep up."

In connection with this discussion, Marshall Dilling, superintendent, A. M. Smyre Mfg. Company, Gastonia, who is chairman of the research committee of The Arkwrights, Inc., reported on a test which had been submitted to that body on carding 16, 12 and 8 pounds per hour, all other conditions being the same. On 26s yarn, he said, carding 16 pounds per hour gave a breaking strength of 60 pounds, with an average number of ends down per thousand spindles per hour of 60. The temperature when this test was made was 82 degrees, no relative humidity figures being given. Cutting the carding production down to 12 pounds per hour brought the breaking strength up to 69 pounds, a nine-pound increase, with an average number of ends down per thousand spindles per hour of 59. A temperature of 77 degrees prevailed for this test. Bringing the production of the card down to eight pounds per hour, Mr. Dilling continued, the breaking strength showed 70.43 pounds, with the average number of ends down per thousand spindles per hour reduced to 24. A card draft of 100 was used on all three tests; in fact, only the doffer speed was changed.

T. W. Harvey.

T. W. Harvey, superintendent, Rodman Heath Cotton Mills, Waxhaw, N. C., supplemented this by stating that he added three cards to his equipment of twelve cards, reducing the carding production proportionately, and secured an increase of 7 pounds in the breaking strength of 30s.

"Was this reduction in carding secured by changing the weight of the sliver or the speed of the doffer?" asked H. B. Whitehead, overseer of carding, Graniteville Mfg. Company, Graniteville, S. C.

"The sliver was not reduced," replied Mr. Harvey, "the change being made in the speed of the doffer." Mr. Dilling here added that this was the method used in the Arkwright test which he read.

Beats Per Inch.

The question of the relation of beats per inch to breaking strength was next taken up by Mr. Corn.

One man stated that "I tried reducing my beats per inch with very good results. I cut from 26 to 14 and 15 on the blade beater. This was on low-grade cotton. It did not clean the cotton as well, but it gave us a better breaking strength. We got a better average on low-grade cotton, and my theory is that the low-grade cotton is weaker, and the beater breaks it up much more readily."

"But isn't that contrary to what most of you do?" asked Mr. Corn. "Don't you beat more on the low-grade?"

"I reduced my beater speed on the breakers from 1,000 to 900 r.p.m., and I also reduced my speed on the finisher carding beater from 1075 to 800 r.p.m., and I increased my breaking strength about four pounds, using one-inch cotton," reported another man.

Answering Mr. Corn's question, Mr. Chapman pointed out that most mills had to secure clean cotton. He said he is hitting the cotton 56 blows per inch on the finisher, this being reduced one-half with the installation of some new opening machinery. He next asked "in reducing the beater speed, is it better to reduce the revolutions per minute of the beater or increase the amount of cotton going under the feed roll?"

J. L. Brannon, overseer of carding, Chadwick-Hoskins Mill No. 1, at Charlotte, stated that he had just had an experience which might throw some light on this. "We have three processes of picking," he said, "and we have a porcupine and Kirschner beater in the breakers, and blade beaters in the other two. We were beating 58 beats to the inch, and we increased the feed roll to cut our beats down to 40 and we got much better results, and moved the beater from the feed roll to ¼-inch. I cannot give you any figures on the breaking strength, as we had been on 1 5/16-inch cotton and changed to 1¼-inch but I do know that the breaking strength on this is as good as on the other."

J. L. Brannon.

Before leaving the picker discussion, T. N. Crocker, overseer of carding, Mollohon Mill, Kendall Mills, Newberry, S. C., brought up another influence on breaking strength. "I have found that the cut-off plate in front of the beater has quite a bit to do with the lap," he said. "If it is set too far it will carry the cotton around two or three times, but it it is set close enough, it will knock it off on the first revolution. We have the 30-inch Buckley beater on our breakers, and blades in front, with the carding beater on the finisher. On one particular breaker beater—it seemed to have been in a wreck of some kind—I noticed that somebody had made a temporary cut-off plate with about three inches distance. I began to observe things very closely, and brought that setting to ⅛-inch, and it made a much prettier lap. I think that it is an important thing." Another man reported a similar experience, stating that the ⅛-inch setting here was the proper one.

"I would like to ask about the Buckley and Kirschner on the breaker," requested B. F. Underwood, overseer of carding, Piedmont Mfg. Company, Piedmont, S. C. "Which will give the best cleaning?"

"I have both on the same machine," reported Mr. Brannon, "and I find very satisfactory results out of both."

"I have the Kirschner on the finisher and the two-blade on the breaker and also the Buckley," said Mr. Underwood. "I also have the Kirschner beater on the breaker, and I find I get better results out of the Kirschner than I do out of the Buckley on the breaker, and also on the finisher."

B. F. Underwood.

"I used to run a blade on the front and Kirschner in the back," said E. A. Franks, superintendent, Dunean Mills, Greenville, S. C., "and I changed and put the Buckley all the way through and increased the breaking strength five pounds. I use it on all three processes." Mr. Underwood said he had tried the Buckley on the intermediate, but that the feed roll laps up the cotton.

"It won't do it if you get the draft right," said Mr. Franks, and when Mr. Underwood said his draft was 4.48, Mr. Franks said, "I mean the draft to make the cotton come around."

Mr. Harvey compared the picker beater to the haircomb. "There is a difference in the Buckley and blade beater," he said. "The same relationship as between a coarse comb and a fine comb in combing your hair. That is the relation between the striker beater and the carding beater. The carding beater makes the motes fine like pepper, whereas the striker beater beats it down. You will get more specks with the Kirschner beater."

Mr. Odum asked for discussion on the Aldrich beater, a beater made in South Carolina on the order of the Buckley. The chairman stated that it was not in order to discuss particular makes of equipment, but finally ruled that a discussion of different types might be held. However, no one responded to his request for experiences with these.

Settings of Rolls.

"Roll settings" next came up for discussion, in their relation to breaking strength. Mr. Crocker discussed this first, declaring that it is one of the most abused things in the mill. The average overseer, he said, does not have an opportunity to check over every roll setting in the room, and that as a result it is delegated to some second hand or section man, and sooner or later there will be a lot of variation in the settings. He declared that if the average overseer or superintendent would take the time to check over every roll he would find that in a large number of cases, one end of the roll would be set different from the other. He described a device which he uses, which, he states, insures an accurate setting of all rolls to any given setting when this has been determined. Another man bore him out on the usefulness of this device for "squaring the top rolls," which, he said, will give accurate adjustments all through the room, when used.

H. B. Whitehead.

"But what I want to know is for somebody to tell me how to set my rolls on 1-inch cotton in order to get better breaking strength," declared Mr. Corn.

"What machine?"

"Any place, drawing, roving, anywhere."

"Well, don't you think if you set to 1/16-inch over the staple of the cotton, that would be as near as you could get to perfect?" asked one of the members. Mr. Corn replied by asking how this could be done when cotton shows a variation of a quarter of an inch in length of staple in the same bale.

"As I see it," said Mr. Crocker, "the trouble is in the cotton. You remember for the last two seasons our cotton has not opened from maturity, but from drought, and immature staple has been the result. Prior to the war, the farmers picked two or three times, first in September, they would get the early bolls; then in October they would pick from the middle of the stalk, and the bottom in December, which was the dog tail and off-grade cotton. But last year, the cotton opened from the bottom to the top, and it was all picked together just like scrambled eggs, and in a bale supposed to be 1-inch you would find thirty per cent that was not an inch. When you get stock like that I do not understand how any man can get a proper setting for his rolls, so I want to know how we can gauge our rolls. Previous to the war we did not have so much of that. I believe 70 per cent would measure up to 1 inch, but you take ordinary local or Western cotton today and pull it and it will surprise you to find how many different lengths of cotton you can get out of it.

E. A. Franks.

"I have some of that same cotton," added Mr. Corn, "and it has some 1-inch in it and some 5/8-inch, but you haven't told me how to set my rolls for it."

"I set as close as possible to avoid cockled yarn," advised Mr. Harvey.

"I am not going to tell you how to set your rolls," said T. A. Hightower, manager, Kendall Mills, Edgefield, S. C. "You know, you cannot get your rolls closer than 15/16-inch on the ordinary make of frame. My suggestion is to get as close as you can get, and, if you do not get cockled yarn, stay there; if you do, back off until you eliminate it."

Drawing Roll Speeds.

"Roll speeds" came up next, and the chairman decided to start at the drawing frame, and asked for discussion of roll speeds here. J. V. McCombs was the first to respond:

"You remember that four or five years ago we would not take into consideration the effect of drawing roll speed on breaking strength, and most of us were running between 375 and 425 r.p.m., but now I believe a majority are between 275 and 325 r.p.m. I believe that a man running drawing over 300 r.p.m. is going to get into trouble. If he can get down to 275 it would be better. I have tried from 260 up to 450, and I have found better results at 275 to 280 than at any other speed."

"Better results in what way, Mr. McCombs?" asked the chairman.

"In breaking strength, running of the work and every other way," answered Mr. McCombs. "I do not believe a metallic drawing roll ought to exceed 300 r.p.m."

Mr. Harvey stated that he has a speed of around 200 r.p.m. on cork rolls.

Mr. Underwood asked Mr. McCombs what size roll he used and the reply was 1⅜ inches.

A. P. Richie, superintendent, Dixon Mills, Gastonia, N. C., made the following report: "At the last carders' meeting in Spartanburg, I had my leather-covered rolls running 315 r.p.m. We have reduced them to 168 and we find we gained about four pounds in breaking strength, with better running and more even sliver."

It was at this point that Mr. McCombs discussed the comparative merits of leather-covered top rolls and metallic top rolls for drawing frames. He said that when he was in New England, he was operating a mill of 16,000 spindles on 1⅞-inch Sea Island cotton, using leather-covered top rolls on the drawing. When an additional mill of 40,000 spindles was put in, he said he equipped the drawing with metallic top rolls, in spite of the fact that every leather roll manufacturer opposed him; that he staked his reputation and his job on them. As a result, he said, the leather-covered rolls running 280 r.p.m. produced a breaking strength of 144 on 23s, while the metallic rolls at the same speed gave a break of 152 pounds on the same yarn. "I think I was the first man in New England to put in metallic rolls," he said, "and I believe everybody in New England came to watch them run. I have always got more strength out of metallic rolls because the leather rolls slip more, and the cotton laps up so bad on them."

L. O. Bunton.

Mr. McNeel of Gaffney indicated that his experience did not agree with Mr. McCombs'. "I have two mills, and in one I have metallic rolls, and in the other leather rolls. The metallic I run 326 r.p.m. and the leather about 322 r.p.m., and there is practically no difference in the breaking strength in our No. 1 and No. 2 mills. Both use 1-inch cotton."

"I do not believe there is a mill in the country running leather rolls 280 r.p.m. where the drawing hand can run 30 deliveries, and on the metallic rolls at this speed the drawing hands run 48 deliveries due to no lapping up," declared Mr. McCombs. Mr. McNeel stated that his hands run 36 deliveries on the leather covered rolls.

"I reduced my speed from 400 to 254 r.p.m., and the drawing hands run 40 deliveries," reported Mr. Underwood. "It also increased the breaking strength—I do not remember just how much." He added in response to a question that it was not necessary to add any frames—that the drawing kept up just as well at the reduced speed with the same equipment.

The Luncheon.

At 12:45 o'clock the discussion meeting was adjourned, and the members repaired to the Efird Department Store dining room for luncheon, which was enlivened by vaudeville acts from a Charlotte theatre, furnished through the courtesy of C. W. Allison, of the General Equipment Company, and other textile equipment interests in Charlotte.

The Afternoon Session

was begun at 2:30 o'clock with a continuation of the discussion on factors affecting breaking strength. At the start of the session, Gordon Cobb announced that a meeting of the Arkwrights would be held later in the afternoon, and called attention to the similarity of their interests.

Draft on Cards.

The first question brought up in the discussion was the matter of card drafts, and Mr. Corn asked, "What is the best card draft, making 30s and 40s yarn?"

"I think 95 would be best," replied one man. Mr. Crocker preferred a range between 100 and 110. He said he got better breaking strength here than at 85.

"I think when you talk about draft," said Mr. Hightower, "you first have to consider the weight of the lap. If you run a 10-ounce lap your draft will probably run 95 or 100, but if you have a 13-ounce lap, your draft must be changed entirely. I used to run a 11-ounce lap, and I am now using a 13½-ounce lap with 113 draft."

L. L. Hurley.

"Suppose you had not heavied up on your lap and had increased the draft?" inquired the chairman.

"I wouldn't have enough coming through the cards to keep up."

"Suppose you had increased the doffer speed?"

"That would be carding too quickly."

One member brought up that the licker-in will not do as much cleaning on short draft as on long draft. "You wouldn't have any more cotton coming through the licker-in than before," said Mr. Hightower.

"Why long draft?" inquired Mr. McCombs. "My experience on long draft has been this. I do not believe there in a man here who is carding staple cotton—I mean 1½-inch and up—who is running anything like a 95 or 98 draft on his cards. We know when the neps are allowed to go into the yarn, when they get to the rolls the machine cannot insert the proper twist, and in order to get good twisted yarn, we must eliminate the neps. I have never seen a staple mill under 120 draft. The best I ever saw was using 140. I have carded Sea Island cotton with a card draft of 132.

"You couldn't get the neps out with short draft if you wanted to. You must give the licker-in time to get into the cotton. On the other hand, I believe the elimination of the neps is far more beneficial than the evenness, if there is any difference. In any case, where I have lengthened my draft I have increased my breaking strength." He cited an illustration of a mill on bag goods, which require 40 pounds breaking strength to the square inch, 18sx18s yarn, where by increasing the draft from 105 to 122, without making any other change, he raised the breaking strength from 36 to 44 and 48 pounds, on the same cotton. Questioned as to the method of increasing his draft, he said he increased the lap from 11 to 13½ ounces, reduced the sliver from 60 to 54 grains, the doffer speed from 12 to 9 r.p.m., and the production from 125 to 110 pounds per 10-hour day.

C. P. Hamrick.

David Clark, of Charlotte, stated here that a friend who had visited England had told him of a mill of 500,000 spindles in that country which did not use a card draft under 191. Also of another man who said that in making tests along this line he had found increased breaking strength up to 125, the yarn getting weaker beyond that point.

"We draft 127, but of course we do not card very heavy, only about 40 pounds on Pima cotton," reported Mr. Franks.

Mr. Hurley asked Mr. McCombs if there was any ma-

terial difference in the amount of waste with the long draft to get out the neps.

"The only material difference is that you take out more fly on the long draft because the licker-in gets into the cotton better, and that is just exactly what you want."

"If that's the case, wouldn't speeding up the licker-in give the same results?" asked Mr. Crocker.

"No," aswered Mr. McCombs. "On Sea Island cotton we do not run the licker-in but about 190 r.p.m. The rule is that the longer the staple of cotton the less speed of the licker-in. On regular cotton down here we usually run about 430 to 450 r.p.m., on print cloth numbers, but when you get on long staple cotton, you have to decrease the speed."

H. G. Winget.

"Where do you take the neps out," inquired Mr. Franks.

"At the flats," replied Mr. McCombs. Mr. Franks brought out that the flats load quicker with long draft, and therefore what is the advantage, and it was brought out that when the flats load, it is an indication that the neps *are* coming out.

Continuous Card Stripping.

L. O. Bunton, superintendent, Ruby Mill, Gastonia, N. C., asked if anyone has had experience on a new continuous card stripper which eliminates the usual system of stripping.

"I think I know what he refers to," answered Mr. Dilling. "It is a new stripper brought over from Europe which is attached just under the flats. The surface of this revolves in the same direction with the card cylinder and just a little bit faster, and it has a vibrating motion and its teeth come up through the teeth in the card cylinder and are constantly stripping it. I have one that has been in four weeks and it has not been stripped since it was put in. The card is freshly stripped at all times, just as though it had been running about a minute after the regular stripping. It is necessary, however, to strip the doffer occasionally. I find I have more fly waste but of course no cylinder strips. That all goes in and works itself out with the other cotton. I have not found any additional waste coming out in the combers. I do say it will keep the cards stripped continuously."

"Does it have any effect on the weight of the goods?" was asked.

"Yes," said Mr. Dilling. "The sliver was just a little bit heavier, indicating that some of the fibers that would come out in the cylinder strips came out in the sliver."

Someone asked the cost, and Mr. Dilling advised that it is around $200 per card. He added that "I find there is much more uniformity in the weight of the sliver than without it. You know one of the problems we have always had has been light sliver following stripping and heavy sliver just before stripping when the cylinder is loaded. This attachment eliminates the variation from stripping time to stripping time. I have not found any increase in breaking strength, but may be able to tell something more definite about that later."

Reversing Card Flats.

C. P. Hamrick brought up the question of reversing the card flats in order to produce a cleaner web, and Marion T. Grimes, formerly superintendent of the Gluck Mills, Anderson, S. C., was asked to tell the results of his experiments along this line at that plant.

"I had H & B cards," replied Mr. Grimes, "and the only thing I did was to change the belt on the driving pulley, and in order to strip the flats I speeded up the comb and made it run somewhat faster. But where I thought I got better results in the web than I did running the flats in the regular direction, I took out more strips, and I wasn't able to set the stripper plate to where I could get my strips down to the proper percentage. That, and the looks of the flats on the cards, made me decide to change them back. I really think if you could get the stripper plate set so it will get the percentage to the proper amount it would be a good thing."

"Did it take out any more long fiber?"

"I cannot say," answered Mr. Grimes, "but I got more strips, so it must have taken out more fibers."

The next question taken up in order was the subject of different methods of creeling drawing frames, and quite a diversity of practice developed here, some preferring the practice of creeling all at one time, and others as the cans run out. The former method, it was pointed out, tended to produce evenness; also it is possible to set the cans closer together.

Humidity in the Card Room.

The next question asked for practice with reference to humidification in the card room, and by a vote it seemed a majority of those present use humidification in this room. One man stated that he runs a relative humidity of 56 per cent, while another man reported 60 to 65 per cent.

Mr. Whitehead of Graniteville was called upon for his practice. He stated that running a .50 to .70-hank roving on his slubber, and 1.70 to 2.20-hank on his fine frames, he carries between 60 and 65 per cent.

Another man stated that on 5.50- to 7.00-hank roving on his fine frames, he carries between 45 and 50 per cent.

"In a mill in South Carolina that I recently ran, we made from .51 on the slubber to 3.20-hank on the fine frames," said Mr. McCombs. "We had the mill well humidified straight on through from the pickers, making osnaburgs and coarse yarns, from 26s to 4½s. We carried 64 per cent relative humidity in the card room."

L. L. Brown.

H. G. Winget, superintendent, Winget Cotton Mills Co., and Victory Yarn Mills, Gastonia, N. C., said that "we run 78s and 80s, and we try to hold it around 55 per cent in the card room, and get very satisfactory results."

"Have you tried it any higher?"

"We didn't get along very well with it any higher because we have combers."

"We run 40s to 100s," said Mr. Franks, "and we find that you cannot run the high humidity on Pima cotton that you do on regular cotton, so we installed a system of drying in our opener room. We put the steam in the opener room and then when it comes to the card room we can put it back in. We run around 55 to 60 per cent relative humidity."

"That statement will also hold good on other Western cottons," declared Mr. Bunton. "If you use the same

humidity on some of the Western cottons that you do with our local cotton around here, it will lap up around the rolls."

"I would like to explain just why I run the heavy humidity that I do," requested Mr. Whitehead. "The natural humidity of every locality is not the same; consequently the artificial humidity will vary with the natural humidity. Our locality is low, and is somewhat damper than some other localties, and therefore I run 60 to 65 per cent relative humidity, and have more control over my extreme heavy weather. That is the reason I run it so heavy. When my extreme heavy weather comes on I do not use my humidifiers, and then to catch the variation I change the draft on the slubbers. If during a protracted damp spell the laps become saturated I heavy up on the slubbers. By that means, I have run this department four years and have not changed a tension gear on any fly frame in the mill, except when I changed from one number to another."

"If you would go back to the picker room you would get away from changing the gear on the slubber," suggested Mr. Corn.

"Well," responded Mr. Whitehead, "I do not do it except in extreme cases where they get away from me."

On Western cotton, reported Mr. Corn, with automatically controlled humidity, he runs between 62 and 65 per cent relative humidity in the card room, running the same from the pickers right on through.

"When you raise your humidity without changing the twist will you have trouble with hard ends?" was asked.

"You probably will," answered the chairman. "We run a little less twist."

Alkali in Western Cotton.

"Has anybody had any experience with Western cotton with alkali in it?" inquired Mr. Dilling. "I had that trouble, but went off of it before I got any definite information on it. Cotton takes on the nature of the soil in which it grows. Some of this Western cotton has this alkali in it, and it gets into your mill, and with a certain amount of humidity it will become moist and stick to the rolls, especially on the combers, and they will not run. If anyone has any ideas on it I will appreciate hearing them."

Mr. Bunton offered a theory advanced by an investigator at State College at Raleigh, which he said seemed plausible. "He claims that cotton raised in irrigated country, the sun beats down and dries up the moisture in the gummy fluid inside the fiber so quickly that the cells do not have time to absorb the solid matter, and that is left inside the cotton fiber, and when you humidify this in the mill it absorbs the moisture and causes the fibers to swell out just like green cotton," he said.

Stanley W. Converse.

"We had that same trouble with Pima cotton when I was with the Department of Agriculture at Clemson," said W. G. Blair, of the Armstrong Cork and Insulation Company, "and we found that it was necessary to hold the humidity down in order to prevent excessive licking up." He said that chemical analyses showed practically no difference between the Pima cotton from Arizona and the South Carolina cotton. He added that on Sakellarides 60 to 65 per cent can be run, but on Pima it is necessary to go down to 55 to prevent licking up.

"I ran Sakellarides, and Pima and Sea Island cotton together in one mill, about one-third of each," reported Mr. McCombs, "and I was up against the same proposition of licking on the combers. I tried cutting the humidity down to where the Pima cotton would not lick, and I got into trouble on the Sea Island, due to insufficient humidity for this staple. I used a roll varnish once a week, putting on a very thin coat, and it practically stopped the licking up, and I carried a humidity around 55 and 60 per cent.

P. A. Smith.

"In 1913, there were about 1,700 bales of this Arizona cotton raised, and I used around 1,000 bales of it. The Goodyear people were experimenting with it. I have a lot of tests that I would be glad to send in to the research committee if they care to look them over. Another thing about that Pima cotton is this. When we put that cotton through the drawing frame I said 'That sliver doesn't look right.' The Sea Island and the Sakellarides was combed, and the Arizona cotton was carded. We changed the tension gear on the drawing, on the same weight sliver, and ran a five tooth larger tension gear on the drawing on the Arizona cotton than we did on the Sea Island and Sakellarides before we obtained the same breaking strength. After twisting, the Arizona cotton increased in breaking strength over the other two."

S. W. Converse, assistant superintendent, Clifton Mfg. Company, Clifton, S. C., asked "How high can you run humidity without rusting the card clothing?" Mr. Corn said that in his opinion a man would be safe from rust up to 70 per cent.

In response to the next question from the chair, no one present seemed to be using humidifiers in the picker room.

The next question was with reference to changing the weight of the picker lap in accordance with the changes in the relative humidity of the picker room, and several men indicated they did this after the fashion of Mr. Corn as described at the Greenwood, S. C., meeting of the division in December, 1924, a complete description of which will be found on page 375 of the February, 1925, issue of COTTON. This consists of taking the hygrometric or psychrometric reading of the room at regular intervals, and adjusting the weight of the lap accordingly on the basis of a table of moisture regain in the lap at different readings. One man, Mr. Harvey, took the opposite viewpoint, stating that if weather puts the moisture into the lap, it will take it out; that he had not changed a picker room lap in four years.

Twist in Roving.

The next point brought up was the relation of twist to breaking strength. "Now let's get onto the thing that we will never agree on," said the chairman, pointing out that in the compilation made at the morning session, there was a variation of from .95 to 1.34 on the same hank roving. "Does twist in the card room affect the breaking strength of the yarn?" he asked.

"If you get too much it will make uneven work, and you cannot get production," was an answer. "You must have a good soft twist. You have a standard to go by."

Mr. Corn asked if he recommended going by the standard of 1.20 times the square root, and this man replied that on 1-inch cotton such a practice would result in greater breaking strength and smoother yarn.

"You should run just as little as possible not to stretch the roving," said another man.

L. L. Brown, general superintendent, Clifton Mfg. Company, Clifton, S. C., stated that his Arkwright test dealt with this subject. He did not remember the figures, but recalled that taking one tooth out in the finished roving gave an increased breaking strength.

P. A. Smith, superintendent, Ninety-Six Cotton Mills, Ninety-Six, S. C., who also tested this for the Arkwrights, stated that he made some 1,200 breaks on this point, "running 2.75-hank single roving, making 21s yarn, with twist multiples of 1.24, 1.27 and 1.36. If I remember correctly, the 1.24 broke weaker than the 1.27, and the 1.27 broke stronger than the 1.36. I found there was a place it broke best, and if I went under it it weakened it and if I went over it it weakened it."

R. H. Layton.

Mr. Corn asked for practices on finer hank rovings. Mr. McCombs reported 1.32 on 7.50-hank. Another man said 1.50 on 5.50-hank, and another man 1.50 on 6.50- and 6.90-hank.

R. H. Layton, overseer of carding, Anderson Cotton Mills, Anderson, S. C., said that "About 1.53 is what I run on 6.00 hank, and about the same on 7.40-hank. In the past I usually ran higher on the 7.40-hank but now I am running just about the same on both. I have never been able to run as low as some people on a 7x3 frame."

Mr. Franks changed the discussion here by asking if reverse-twisted yarn of the same number breaks any higher than regular twist. This was not thoroughly answered, and a further discussion of it was suggested.

The final question asked "What feed plate setting is best on one-inch cotton for breaking strength?" Mr. Harvey said he uses a 17 and his 30s break around 57 and 59 pounds. On a show of hands, the following vote was found: Three use a 17 setting; eleven a 12; sixteen a 10; four a 7. One of the men using a 7 indicated that he uses a 10-ounce lap.

This concluded the discussion and the meeting.

Manufacturing in the South

BY LUTHER H. HODGES AND HARRIET L. HERRING.

The article below is one of a series which has to do with the fundamentals of business, or, more properly known as Industrial Economics. These articles are being published from month to month. Each one is a unit in itself, although forming an integral part of the entire series.

Practical mill men like practical material and these articles are designed to meet the needs of textile operating executives who are interested in knowing more about the laws governing business and industry. The entire series has already been used by a large cotton mill organization in the South in its educational work, and this organization found the material to be very practical and effective.

Each article lends itself to discussion by groups of mill men, as well as being helpful and interesting reading. Naturally the articles are brief and in attempting to cover this large field, only the most important points have been considered.

In a former article the South was referred to in connection with the textile industry. Large though it is at present, it is of very recent development. The story of industry in the South is really a history of the South, for linked up with its industrial development is the entire economic, social and political life of the section.

Manufacturing in the Colonial South.

Many parts of the South, especially the piedmont section and most especially the piedmont section of North Carolina, were settled originally by craftsmen and tradesmen from Pennsylvania and from Europe. As in any normal community which is fairly well balanced in its resources, soil, climate, minerals, etc., the development of all except the rice and tobacco areas on the very coast was well balanced. As late as 1810 the manufactured products of Virginia, North Carolina, South Carolina and Georgia exceeded those of the whole of New England. There were a few little spinning mills in the South as early as the 1790's and the machinery for them was made in the South. Iron works were common all over the South. George Washington and Thomas Jefferson themselves were iron manufacturers.

The Decline of Manufacturing.

The invention of the cotton gin with the resulting increase in the demand for cotton; the soil and the climate, combined with the institution of slavery, placed the South in the natural position to specialize in producing cotton, just as Birmingham, Alabama, is in the natural position to produce iron and steel. From raising 140,000 bales or 13 per cent of the world's supply of cotton in 1800 the South in 1860 raised 3,242,000 or 76 per cent of it. For the last decade we have averaged about 55 per cent of the world's crop. The price of cotton stayed above 25 cents a pound for the first 25 years. But the production of cotton was most profitably carried on in large plantations with slave labor. All the available capital was devoted to cotton raising. White labor that was already making up the industrial class, a class that would have grown had the industry increased, now had to farm in sections not preempted by slavery or move to newer parts of the South where, with free land and a few slaves, they could set up as cotton producers themselves. Others were pressed farther into the piedmont and mountainous sections to remain for two or three generations as small farm owners or tenants. With the revival of industry they formed the reservoir of labor that has carried on the new work. Immigration, that great source of manufacturing labor, steered clear of the South because of the competition of slave labor, and the resulting economic system.

While, of course, there were a few mills in the South that started between 1800 and the Civil War, the number was very small and the products coarse. In 1850 the entire South had only 7 million dollars invested in textile manufacturing, using 78,000 bales of cotton against nearly 54 million dollars in New England using 430,000 bales. The total cotton goods made in the South was a mere fraction of what those states used, while in other lines of manufacturing there was practically nothing.

Stagnation Following the War.

Following the Civil War the social and economic confusion in the South was too great even to carry on the old familiar business life. Reconstruction, the freed negro, poverty following the destruction of the war, lack of cap-

ital or credit to start new ventures, the temporary high price of cotton putting a premium on raising it, the killing off in the war of practically a whole generation of men who would have been most active in turning to new ventures—all these things caused the South to remain inert as far as industry was concerned.

Dr. Broadus Mitchell, in an extensive study of this period, places the revival at 1880. In the years since that time the economic changes in the South have been just as truly an industrial revolution as that in England 100 years earlier.

Revival Was Conscious and Planned.

One great difference between this and the English revolution, however, was the fact that it was quite consciously striven for instead of "just happening" as the outgrowth of economic conditions. The South had had a terrible lesson in the helplessness of a great region dependent on others for every necessity of life. They had seen the dangers of specialization carried too far. They had seen the wastefulness of doing only one thing which left so many of its natural resources undeveloped and so much population and talent unused.

Southern statesmen plead for cotton mills. Southern newspapers printed every note about a new mill and heralded each as the dawn of a new day in Southern economic independence. Far-sighted young men like D. A. Tompkins went into the North and to Europe to study engineering and textile manufacturing. Every town wanted its cotton mill. General merchants, with a little capital, went into cotton milling to keep business going. When an entrepreneur on his own account was lacking, any man with executive ability was pressed into service—a preacher, a doctor, a farmer would be put at the head of a small enterprise, the stock being subscribed by local business men. It came to be a matter of community pride that the town have its mill. Some even complained that it had got to the point that a man's position as leading business man of the community was questioned if he was not president of a mill!

The citizens of some small towns got together and subscribed stock to build a mill because means of employment were needed in the town. At a revival meeting in Salisbury, N. C., 1887, the evangelist declared that "the greatest morality in Salisbury was to go to work and that corruption and idleness and misery could not be dispelled until the poor people were given an opportunity to become productive. The establishment of a cotton mill would be the most Christian act his hearers could perform."

Local Capital.

While a great deal of publicity was given to all Northern capital put in Southern mills, it seems to be certain that most was furnished by the South itself, and that it furnished most of the men. In view of these things—the newness of the industry, the deliberateness with which it was promoted and the untrained men in charge, it is remarkable that so few losses resulted. Dr. Mitchell says that in a total investment of $100,000,000 the total losses would not amount to 20 per cent. Of course, some did not pay dividends for a while and then not large ones but everybody derived at least an indirect benefit from the establishment of the industry. Most paid well, however, except for occasional setbacks in the 80's and 90's. The decade just preceding the Great War was very hard on them and found most in a bad financial condition. One reason for this was the panic of 1907, from which recovery was slow because the South had specialized too much in yarns, coarse fabrics and print cloths. Indeed, the whole textile industry of the country was slightly overgrown at that time, with resulting overproduction.

North Carolina and the Revival.

North Carolina felt the stimulus of mill building somewhat later than South Carolina because the people were more individualistic—more Scotch blood. They went more "on their own" with less pooling of resources in the hands of one capitalist. Thus, more people had to be converted to the idea of mills than in a state like South Carolina, where social unity was of long standing and the example of a few was more powerful. This condition is still reflected in North Carolina in the vast number of small independent mills.

Present Extent of the Textile Industry in the South.

In the consumption of cotton the South rose from 604,000 bales in 1890 to 4,487,000 bales in 1922-23. In capital invested the South rose from $131,000,000 or 35 per cent of the total in United States textiles in 1900 to $837,000,000 in 1920 or 45 per cent of the entire country's investment. In January, 1924, a New England engineer stated that 100,000 spindles were being shipped from that section to the South. Practically all the expansion in the industry for the past five or six years has been in the South. In 1924 the South had 998 cotton mills. Its expansion is graphically shown in the following table:

SOUTHERN COTTON SPINDLES.

1860—	295,359	1900—	6,267,163
1870—	338,860	1910—	11,283,359
1880—	561,360	1920—	15,657,951
1890—	1,819,291	1924—	17,194,171

The following table shows the number of cotton spinning spindles in the leading countries of the world, according to the latest available statistics. It will be noted that the United States has nearly 24 per cent of the total world spindles.

COTTON SPINDLES IN LEADING COUNTRIES.

Country	No. of Spindles	Country	No. of Spindles
Great Britain ..	56,582,873	Brazil	1,700,000
United States ..	37,408,689	Belgium	1,682,965
Germany	9,605,077	Switzerland	1,512,562
France	9,600,000	Poland	1,200,191
India	7,331,219	Canada	1,076,084
Russia	7,245,935	Austria	1,022,792
Japan	4,877,416	Mexico	770,000
Italy	4,570,000	Holland	668,540
Czecho-Slovakia.	3,508,444	Sweden	566,381
China	2,680,000	Finland	240,862
Spain	1,812,785	Portugal	487,152
Total			156,149,967

In 1921 North Carolina outranked all states in the manufacture of yarn for sale. South Carolina and Georgia outranked Massachusetts in unbleached sheetings. South Carolina produced 50 per cent of the print cloth in the country. Georgia ranked first in tire fabric manufacture. North Carolina and Massachusetts were equal in cotton flannel. New England exceeded in ginghams and fine fabrics. In 1924 North Carolina lead all states in the manufeture of denims, canton flannels, flannelettes, and blanketings, towels and towelings, cotton table damask, sheets and pillow cases and commercial yarns. It was second in tobacco, cheese, butter, bunting and bandage cloths, gingham, shirtings, ticks and blankets and cotton waste. North Carolina had in 1924 48,600 men, 30,340 women, and 4,770

children 14 to 16 years employed in the textile industry in 386 mills, according to the official figures of the State Child Welfare Commission.

Diversification within the Textile Business.

Some of the figures given show that the South is showing diversification in the nature of its textile products. All the diversity is not shown unless we had figures for the increasing number of bleacheries, finishing plants, print works, overall factories, shirt factories, etc., that make complete the processing of cotton from the seed to the wearer. These latter developments are so recent as to come under our observation in the last decade. The demand for these phases of manufacturing development grew out of the same sort of feeling that we saw earlier, about 1880, in regard to the whole of manufacturing, namely that the South was too specialized.

Diversification Outside Textiles.

In 1920 the South had 66,500 establishments capitalized at $6,883,000,000, of which less than 1/7 was in cotton manufacturing. 200 different industries were represented. Cotton manufacturing was the greatest single industry, with lumber and timber second, flour and grist mills third, followed by cotton oil mills, petroleum refineries, slaughter and meat packing, tobacco products, iron, steel and coal, furniture, etc. This diversification in manufacturing is paralleled in agriculture also, so that the whole section is far more self sustaining, and in a healthier economic condition.

Problems of the New South.

This economic revolution in the South has naturally brought many problems in its wake. Mere mention of a few of them is all we have space for.

1. Child Labor. Industry in the South was passing lately through the same stages that it has passed through in older centers. England and New England, in their earlier stages, took child labor for granted and so did the South. It was even more natural here because the families from the farms who came to man the new mills had been used to having the children help in the support of the family. Although the southern states have now eliminated this evil it is still remembered against them, and is now the chief argument for a child labor amendment advanced by dwellers in other parts of the country.

2. The Negro and Industry. The South has never found a place for the negro as an integral part of its new industrial development. Unless this is done, we shall have periodic flows of negroes out of the South and as we have no incoming labor supply, such exoduses inconvenience agriculture and the fringes of industry in which he is employed, and indirectly upsets balances all along the line. Then he returns when times are bad in his new found home to complicate our own dull periods, to say nothing of raising questions of his social status.

3. Tenant Farming. All over the South, and in the better farming sections to a marked degree, industry must compete with farming. Under the tenant system it is just as easy to move to the farm as it is to move from one mill to another. In years of good prices for farm products the labor supply for industry of many sections is depleted, usually just at a time when the industry is booming and needs them most. Then, with a bad farm year, they flock back to the industry again just when with general depression the mills are slack.

Questions.

1. What are the advantages or disadvantages of a one-industry town?
2. Would a whole community benefit from the establishment of a mill? How?
3. Was the deliberate will of the Southern people to have industry sufficient to make the mills successful?
4. What constitutes a "paternalistic" employer?

Burkart-Schier Adds to Equipment and Personnel.

An addition is being made to the sulphonating plant of the Burkart-Schier Chemical Co., Chattanooga, Tenn., it is announced. Contract has been placed with the Chattanooga Boiler and Tank Co., for a new battery of sulphonators. Also, a new line of equipment to make sulphonated tallows, sizes and finishing compounds is being installed. The sulphonators are equipped with individual motor-driven agitators. This new equipment will approximately double the capacity of the plant. A fuel oil burner is being used instead of coal. Formerly the company specialized in sulphonated castor oils, but now plans to produce a complete line of textile specialties.

An Interior View of the Burkart-Schier Laboratory.

J. V. Thomason, formerly associated with the Hart Cotton Mills, has charge of sizing compound sales for the Company in the Carolinas and Georgia. J. S. McAlister and W. P. Bolen handle the sulphonated oils in this territory. The company maintains sales agencies in Greensboro, N. C., Greenville, S. C., Rocky Mount, N. C., and Chicago, Ill., with general offices and plant at Chattanooga. W. J. Kelly, Jr., is sales manager of the textile manufacturing division. T. A. Martin has been made assistant to Mr. Kelly, being transferred from the chemical to the oil division. E. L. Fletcher, chief chemist, has been made plant manager and has charge of all production and research. The company also has the services of an additional chemist specializing in analytical work. The other officers are C. A. Schier, president; J. A. Huff, vice-president; W. A. Bentel, secretary; A. S. Burkart, assistant treasurer.

A New Machinery Booklet.

As the second of a series of four pamphlets covering their complete line of picking machinery, the Whitin Machine Works, Whitinsville, Mass., have issued a booklet covering their latest condensers, conveyors, and cleaning trunks. The first pamphlet described their bale breaker, and the third and fourth, to be issued, will cover opening machinery and picking machinery, respectively.

WASTE!

Textile Operating Executives of Georgia Discuss the Prevention of Manufacturing Losses.

Waste and its control in the carding and spinning departments formed the theme of discussion at the Spring meeting of the Textile Operating Executives of Georgia, which was held at the Henry Grady Hotel, Atlanta, on Tuesday, March 15th. The pertinence of the subject for discussion resulted in the largest attendance in the history of the organization, a number of visitors from other states being added to the attendance of Georgia men. In addition a large number of textile students from The A. French Textile School of the Georgia School of Technology, Atlanta, attended with Director Hibbard S. Busby.

R. J. Jennings, of the Lanett Mill, West Point, Ga., conducted the discussion, which was opened immediately following preliminary announcements by Robert W. Philip, associate editor of COTTON, who as secretary presided in the absence of General Chairman Bachman and Vice General Chairman Dennis. Frank K. Petrea, of Columbus, was called upon for the invocation.

Opener Waste Percentages.

In opening the discussion, Mr. Jennings took up as the first question, the following: "What percentage of the waste taken out through the cards is removed (a) in the openers; (b) in the pickers; and (c) in the cards? In answering this, state grade of cotton used, and base the percentage figures on the amount of net cotton going in, exclusive of bagging and ties. List opening equipment and number of picking processes." Mr. Jennings explained that in the advance answers received to this question, there was no similarity in the methods of pointing off decimals in referring to the waste percentages. However, there was some interesting discussion at the meeting.

W. C. Hardy, overseer carding, Berryton Mills, Berryton, Ga., was the first to report, saying that from 12,324 pounds of cotton, he took out 2.1 per cent in the openers and pickers and 5.3 per cent in the cards. He said he has one bale breaker with Crighton opener, then an English cleaning trunk, and three processes of picking. The card percentage given, he said, included all fly, motes and strips. He said that he uses Good Middling cotton.

Mr. Jennings asked for waste percentages from the horizontal type cleaner, and D. R. Senn, assistant superintendent, Enterprise Mfg. Co., Augusta, Ga., reported on this, stating that in the horizontal cleaner he takes out .16 per cent. Continuing, he gave figures on a lay-out of a lattice cleaner, Crighton opener, horizontal cleaner, breaker, intermediate and finisher pickers, and cards, using 7/8-inch Middling cotton, as follows: lattice cleaner, .96 per cent; Crighton opener, 2.57 per cent; horizontal cleaner, .16 per cent; breaker, .38 per cent; intermediate, .15 per cent; finisher, .10 per cent; cards, 1.35, strips, 1.55, sweeps, .95, and vacuum, .50 per cent, giving a total of 8.67 per cent.

W. L. Phillips, superintendent, Social Circle Cotton Mills Co., Social Circle, Ga., next reported his waste figures. "We run vertical openers in tandem," he said, "and we also have the bale breaker. We do not have the cleaning trunk. The vertical openers take out 2.18 per cent; breaker picker, .218 per cent. We run two beaters in the breakers and they are both carding beaters; one is a pin beater like we use in a waste machine. We do not have a blade beater in the whole mill. Our intermediate pickers take out .234 per cent, and finishers, .231. Our total to the cards is 2.86. We do not take out anything except motes, and the motes cannot be sold today. The man who bought our motes told us to dump them in the ditch and send him the bill."

"What are your card strips?" asked Mr. Jennings.

"We take out a little more card strips than the ordinary mill," replied Mr. Phillips. "We run day and night, and card 80 pounds to the card for ten hours, and are taking out 3.3 per cent. Card fly, 2 per cent, making a total in the card room of 8.36 per cent. That does not include bagging and ties."

In response to a question, he said that this is made from a mix of 50 per cent low grade and 50 per cent Strict Middling. The low grade, he said, is bought for below 10 cents and is called Georgia Red. It is the last picking of tinged cotton.

Mr. Epps raised the point that it was difficult to secure accurate figures without weighing the waste of each card separately, instead of taking the room as a whole. In answer to further questions, Mr. Phillips brought out that the figures he gave were not test figures, but were from a regular report he makes in starting in every two-weeks' supply of stock.

G. S. Jones, overseer carding, Sibley Manufacturing Co., Augusta, Ga., asked if anyone had made any tests on waste using different speeds on vertical opener.

"We did not make that test," replied Mr. Phillips. "This is a test we take every time we open up a supply of cotton. We take the amount of cotton and the percentage of waste and make out a report."

"What speed do you run your vertical openers?"

"We have verticals in tandem," said Mr. Phillips, "making 500 r.p.m. We put through 76,000 pounds in two weeks. That would make about six bales a day of ten hours."

"Do you think, if you put through 10,000 pounds a day you would have a change in your waste?" inquired Mr. Jones.

"Yes," said Mr. Phillips, "it would be lower." He added that his picker beaters run between 550 and 800 r.p.m., and repeated that they are all carding beaters.

Mr. Jones asked if anyone had made a test of 10,000 pounds put through in ten hours, through bale breaker and vertical opener, on 7/8-inch cotton.

"I made a test on 12,000 pounds," replied Mr. Hardy, "that is, it was 12,324 pounds. In the Crighton opener I took out 65 pounds; in the English cleaning trunk, 63 pounds; breaker, 60 pounds, intermediate, 45 pounds, finisher, 42 pounds. The vertical openers were run at 500 r.p.m."

Re-working Card and Drawing Waste.

"What method do you use for re-working card lap and drawing waste?" was the next query presented by the chairman, who added the question, "How many present re-work the drawing waste?" In answer to the second question about one-fourth of the men present indicated this practice.

As to methods for doing this, W. R. Thomasson, superintendent, Palmetto Cotton Mills, Palmetto, Ga., explained that his system is to use a No. 2 bale opener, through which all of the re-worked waste is run, before being returned into the regular stock. He said he has been working his strips back with his other waste for a number of years. The returned waste is torn up in a waste machine, and then fed through this No. 2 opener into the regular line. His equipment consists of a bale breaker, vertical opener, and English cleaning trunk. The No. 2 opener feeds the re-worked waste back into the cotton line between the vertical opener and the English cleaning trunk, so that, as he brought out in response to later questions, the waste does not go back through the opening cleaning processes. Responding to questions from the chairman, Mr. Thomasson explained that after a number of years of adjusting and experimenting, he has this No. 2 opener so arranged that it is impossible to feed back into the cotton more than the desired amount of waste, which is the amount made during a day's run of ten hours. Should a surplus accumulate, it would be held over. The waste opener operates whenever the regular cleaning equipment is in operation.

"I run all my re-worked waste back to my bale breaker," said Mr. Jones of Sibley, "and I want to ask if anybody has any better method. I get good results if my man does not put too much waste in at one time."

"I do not know of any better method," said Mr. Jennings, "unless you get a waste machine so you cannot feed in but so much at a time."

C. R. Brown, superintendent, American Textile Co., Atco, Ga., was asked for his method, replying that "I have a little hopper that feeds back into the suction pipe and onto a special conveyor or distributor over the hoppers."

"In other words, it does go back through the cleaning machines?" asked Mr. Jennings.

"Yes, we start it off in a very small hopper and let it go back through all the cleaning machines and then we put it on this distributor which distributes it among the hoppers."

"Does anyone feed the card lap waste in the breaker picker?" asked the chairman.

J. L. Bowles, overseer of carding, Fairfax Mill, West Point, Ga., was the next speaker. "I have five breakers, and I have a man back of the breakers to look after the different things back there. I feed all of my lap waste and drawing waste back there. The roving waste, and scavenger waste I put through a one-beater machine to tear it up, and feed it through the opener room through the feeder."

"That spinning waste—does it go through the opener machinery?" asked the chairman.

"No, sir," repiled Mr. Bowles. "It goes through the horizontal cleaner."

Mr. Jones answered the chairman's question by stating that he feeds his card and drawing waste into the breaker picker, on the apron, with the cotton, but the re-worked roving and scavenger waste goes through all of the cleaning system because, he believes, he gets a better mixing.

"That is a pretty good way to get rid of it," commented the chairman.

Mr. Jones added that under his conditions, with no special machine, that was the best way he had found.

The chairman next asked Mr. Phillips for his method. "I work all of my card and drawing waste mixed in with the cotton by hand. I put all of the scavenger roll and roving waste through a waste machine and feed it into the hopper with an automatic feeder which automatically feeds the waste into the cotton enough so that it will take care of one day's run. It does not go through the vertical opener or the bale breaker, because if we mix it at the pickers it eliminates the extra beating it would get in the openers."

"But wouldn't you get a better mixing?" insisted Mr. Jones.

"I don't think so," answered Mr. Phillips. "Our cotton comes to the picker room through a pipe from the openers, and we have another pipe connected to the waste opener, which runs at the right speed to let the proper mix of waste and cotton be secured." He said he did not use a lattice apron, as this would require an extra man. Mr. Jones said it did not require additional labor in his case as the regular man fed the cotton to the apron. Regarding the running of the waste back through the cleaning equipment, Mr. Phillips brought out the fact that "the more you beat the waste the worse it is." "Yes," said Mr. Jones, "but the better you mix it the evener it is."

H. T. Woodyard, overseer carding, Consolidated Textile Corporation, LaFayette, Ga., said that "we have a hopper, and, grinding the waste first, we feed it into this hopper with the cotton in the ageing room. You can stand and watch this hopper run and it will take up lumps of this waste before it will take the cotton. The waste is scattered all over the piles of cotton in the ageing room, where it is blown in. We believe we have a good system. Our waste goes through the bale breaker, two vertical openers and cleaning trunks to the pickers—through all of the cleaning machinery."

"Has anyone tested the advantage or disadvantage of running flat strips back through?" asked Mr. Woodyard. "I have tested it, and do not believe there is much value in it."

"The average staple of flat strips is ¾-inch," said C. R. Brumby, Jr., superintendent, Cedartown Cotton & Export Co., Cedartown, Ga.," and if you are running ⅝-inch or ¾-inch staple back through with ⅞-inch stock I cannot see any argument as to the breaking strength."

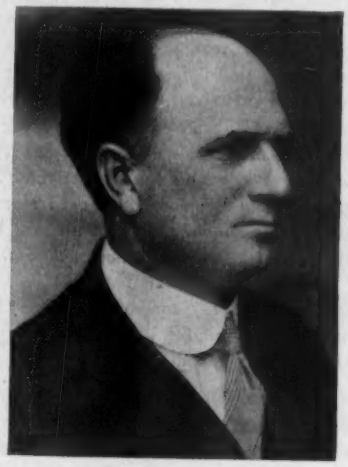
Mr. Brown said he had found that it decreases the breaking strength about 3½ to 5 per cent to run strips back into the work.

J. E. Batson, overseer of carding, Columbus Mfg. Co., Columbus, Ga., next explained his system of re-working waste. "We work our drawing waste and card waste through a breaker picker and distribute it into nine hoppers. We tear it up well and distribute it. We do not make a lap on this breaker; we simply distribute it loose."

Taking Care of Laps.

The next question asked, "What is the best method of taking care of the laps so as to prevent waste between the pickers and cards?" Chairman Jennings announced that, of course, the majority of answers advocated the use of lap trucks to this end. He asked for a good system in a mill where space was crowded, or where the picker room was small and sufficient lap trucks could not be used to keep the laps off the floor between the finisher and the card.

"It all reverts back to carefulness," said J. A. Sorrells, superintendent, Gainesville Cotton Mills, Gainesville, Ga.



John S. Bachman, General Chairman, Superintendent, Anchor Duck Mills, Rome, Georgia.

"And you could let them run just a little bit longer, enough to stick the end to the lap in creeling the cards. Carefulness also should be exercised in hanging the laps up on the card, so the end will not frazzle down and make extra waste."

"It's carefulness that is necessary, just like the brother says," added Mr. Hardy. "I find that to make a good firm lap and handle it carefully, and then get the card tender interested in the job, by letting him know what you want —is the biggest thing. I have found if you will let a man know what you want he will help you out."

"Has anybody tried breaking off the end of the lap just before it gets into the card, or do you let it run right down?" asked Mr. Jones. "You know, the tail end of the lap is always more or less heavy."

"Isn't that where your picker hands double it over?" asked Mr. Hardy.

"Yes," replied Mr. Jones. "A heavy end will run through the card, and if you have a draft of 100 you see what that will do."

Mr. Sorrells brought out that care exercised by the picker hand in catching the lap when he puts in the pin and the cotton comes out from under the catch roll will tend to reduce the amount of lap-over and prevent the lap from being so heavy at this point.

"Back in 1917, I had the boss carder from the Merrimack Mills over to visit my plant," said Mr. Brumby, "and he had some mighty fine ideas about pickers and cards, and from that day until this we have never set a finisher

Frank S. Dennis, Vice-General Chairman, Manager and Superintendent, Consolidated Textile Corporation, LaFayette, Ga.

lap on the floor. We built some trucks that we put these finisher laps on, three on a side—it didn't take very many and they didn't cost very much. As the laps are doffed, we have a conveying lap scale on a trolley in front of the pickers, where they are weighed, and these trucks are carried into the card room, and laps never put on the floor."

"Has anybody experimented with card settings, in order to get out more or less waste?" asked Mr. Jones. "I mean motes and fly," he added in response to a question as to what kind of waste he was talking about. Frank L. Asbury, Jr., superintendent, Hillside Cotton Mills, LaGrange, brought out that the setting of the top knife plate and other settings on the card could be changed to affect this. There was no discussion on this, Mr. Thomasson explaining that this was dependent upon the grade of cotton, and how much waste percentage was desired. However, Mr. Jones said that he had done some experimenting along this line. He said that the average overseer does not know how all of his cards are set, and that recently he had a man check over and set them to a standard. The doffer setting, he said, was changed from a "tight 7" to a "loose 7"; the licker-in to a "loose 10"; the feed plate to a "loose 12"; and, he added, that carding 190 pounds a day, he is able to find a greater amount of motes in his waste, and the carding is just as clean and no more long fibers are being taken out.

His statements brought forth from Mr. Senn an inquiry as to just what was meant by a "tight" and a "loose" gauge. Mr. Senn said that as he understood measurements, a setting was either a certain gauge or it was not that gauge but something else.

Mr. Sorrells explained the terms as being used to allow a variation "necessary with the human element."

Drawing Frame Waste.

"What is the best method of controlling waste on the drawing frame?" was the next question. The chairman asked Mr. Senn to reply.

"I asked my carder that when the questionnaire came in," said Mr. Senn, "and he said 'I try to get them to be careful, and if they are not I just raise hell if they make too much. They know that, and if a card hand happens to come by and drop a handful of waste in a drawing hand's can there's a fight.'"

This question led into the methods of creeling drawing, there appearing some diversity of opinion on this. Mr. Phillips, when called upon, said that his drawing waste was so small that he could not weigh it up against each hand. He explained that he runs one process of drawing, with a front roll speed of 96 r.p.m. (That is right, he said 96 r.p.m. It is not a typographical error.) He has 42 deliveries and uses one drawing hand, putting through 6,000 pounds in 10 hours. His laps weigh 14 ounces to the yard, are 45 inches wide and weigh 42½ pounds, he said in response to questions from the men present. He said he creels his drawing as it runs out.

Mr. Glass, of Shawmut, declared that he creels his all at one time, for the sake of better evenness in his sliver. He said he runs four ends up and runs the front rolls at 230 r.p.m. As the frames are creeled, he breaks out and cleans up, and the cans not empty are arranged according to the system used on the slubber.

"We creel one set at a time on the finisher drawing, and as it runs out on the breaker drawing," said Mr. Batson of Columbus.

Mr. Brumby declared it as his opinion that evener drawing could be secured by creeling as the cans run out.

Docking and Bonus Systems.

The fifth question was, "Is it advantageous to use a docking system for singlings and doublings against speeder and intermediate hands, and a bonus for spinners who take out oily bobbins, lumps, slugs, bad roving, etc.?"

W. J. Simpson, overseer, LaFayette Cotton Mills, LaFayette, Ga., declared that "we have found it satisfactory to use the docking system for singlings and doublings against the frame hands. We carry the system all the way through. The spinners take out singlings against the speeders; the speeders against the intermediates; and the intermediates check up on the slubbers. We pay spinners a bonus of one-half cent for oil, slubs, singlings and doublings."

Mr. Hardy took the opposite view. He said that it is not advantageous to use a docking system in order to stop a hand from making singlings and doublings. First, it leaves an impression with them that they may make bad work by paying a few cents for it; and furthermore, if an overseer has a hand that won't make good work, the best remedy is to get rid of that hand and get somebody who will. However, Mr. Hardy does pay a bonus to spinners for taking out doublings, but does not pay them for singlings.

Mr. Woodyard of LaFayette said they had found a pretty good way to dock—that they dock the overseers of carding and spinning, when bad work shows up in the cloth, not in money, but in words.

"I don't use a docking system," said Mr. Phillips. "However, each speeder hand's roving is marked, and the singlings and doublings every day posted on a board. When a hand gets too careless we jack him up, and if he makes a good record, we compliment him. We do have doublings and singlings, and oily bobbins, but we do not dock."

"It may be possible to get spinners to take out any noticeable amount of bad work without paying them for it, but it is a hard job," said J. C. Edwards of Anchor Duck Mills, Rome, Ga. "We hate the word docking, at our mill, but we do allow the overseer of carding to pay a premium for good work, and our spinners get a premium for bad work taken out. I think our spinners, in all, get about $30.00 a week in premiums, and this is charged back to the card room because the bad work was made there. I do not dock spinners or spoolers for bad work but I do keep a check on them." Mr. Edwards, and Mr. Hames, the overseer of carding, explained their system further in response to questioning, stating that the $30.00 a week referred to is the total of all premiums paid in the spinning room for this work; that a half a cent is paid for each piece of bad work taken out. Mr. Hames said "I pay the speeder hands for bad work caught on the slubbers. If the speeder hands make no doublings, I pay them a cent more a hank, on the total hanks per week. If they make up to five they do not get this, and over five they get a cent less."

"We started making warp yarns for some plush mills several years ago," said Mr. Brumby, "and lumps and slugs gave us a great deal of trouble on this work, so we started a bonus system, and paid spinners a half a cent apiece for each lump and slug taken out. This worked out very satisfactorily. We found in a few weeks that our premiums were running more than our wages, so we cut it down to a quarter of a cent. But we do not dock anybody. We take the singlings and doublings back to the card room and make the different speeder hands straighten up that bad work."

Mr. Bowles asked, with the bonus and docking arrangement, what was done about black oil on the slubbers and drawing frames. Mr. Simpson explained that he does not dock for black oil, but for black places caused by putting up ends with dirty hands, etc.

Using Bobbin Cleaning Machines.

The sixth question referred to methods of removing waste from bobbins, and centered around the use of bobbin cleaning machines. The question was, "Are your spinners required to pull off waste from the speeder bobbins, or is this waste handled by a bobbin-cleaning machine? Which method do you use, and why?"

In response to an inquiry from the chair, it was indicated that approximately fifteen of the mills represented use the bobbin cleaning machine. Mr. Bowles, who was the first to speak on this, said his spinners pull the waste off or twist it off, adding that all the bobbin cleaning machines he had ever seen "rough up the bobbins."

"If you will put the proper clothing on it, and dull it properly, and set the tension so it will not bear too heavily on the wire it will not do it," suggested R. M. Matthews, superintendent, Peerless Cotton Mills, Thomaston, Ga., who stated that he uses bobbin cleaning machines and is satisfied with their performance.

"Our spinners twist off the roving," said Mr. Hampton. "We have arranged to get bobbins without any ring around the small end and believe this will help us. They take them out after it gets to the bottom layer. I have never had

any experience with the machines, but it looks to me like you would get a lot of excessive waste because they would lay it up with one or one and a half layers on it if they knew a machine was going to take it off."

"We do not allow the roving hauler, who collects these bobbins, to take up a bobbin that has more than one layer on it," explained R. M. Matthews as a way of eliminating this trouble. He brought out, further, that with the bobbin cleaning machine the roving waste is prepared to go back into the mixing as soon as it is pulled from the bobbin and does not have to be re-worked.

"We use a bobbin cleaning machine, and have been using it for about a year," reported Mr. Strange, "and as the brother said, we do not use any ring on the bobbin. We required the spinner to twist it off before we got the machine, but every now and then we found some cut waste, and when we followed it through the spinner would say somebody else did it and put it in her box.

"In regard to excessive waste, if you do not allow them to have one layer on the bobbin when they twist it off, you can have the same rule with the bobbin cleaning machine. As for tearing up the bobbins, at first we found one bobbin larger than another, but with the clothing set properly, and the bobbins all the same size so they will go through the machines, you will not have any more trouble."

"We twist our roving off and have no bead on the end of the bobbin, and I think we save in waste," declared Mr. Edwards. "The rule of not using knives is enforced just as strictly as not striking matches in the room. The only person in our room who uses a knife is an old lady who cleans off the doffers' bobbins."

"Does anybody use the machine because it tears up the waste?" inquired the chairman.

"I think the bobbin cleaning machine would produce less short fibers by the action it has on the cotton, than would be the case in running it through a waste machine," said Mr. Matthews.

Mr. Strange added that they do not run the waste from the bobbin cleaner through a waste machine before using it as it is already prepared. "That was part of the idea in our buying the machine," he said.

"We use the bobbin cleaning machine," said Mr. Senn. "We think we would have to have it even if we did not have the bead on the bobbin. We make 4.50- and 5.00-hank roving, and that fine hank roving would be considerable trouble to twist off. We also find that the machine polishes the bobbin rather than damaging it, if it is properly set up, and we believe it is a good thing for our mill."

"I believe on fine roving it would be an advantage," said Mr. Edwards, "but wouldn't have one on coarse roving." Mr. Strange, however, did not agree with him."

Mr. Sorrells said that he uses the machine, and that he has found that it saves waste. On 30s and 40s, he said, he saves 50 per cent of the roving waste from the spinning frame by using the machine. "We try," he said, "to get four inches, with both ends of the bobbin clear. It probably runs between three and six inches. We keep the waste down, we keep the knife off, and get the bobbins smooth around the surface, and it looks like we get better running work on the roving frames. I was afraid of the machine when I put it in, but I do not hesitate to say that I fully appreciate it and like it now."

"How do you cut down your waste?" was asked. Mr. Sorrells explained that with the former method, it was not possible for him to tell just how much the spinners twisted off, and furthermore that his weekly waste figures showed a reduction of between 40 and 60 per cent in his roving waste.

Mr. Hampton asked how many men would be required to operate the machine for a 25,000-spindle mill using 2.25 hank roving, and the reply from those experienced was that one man could handle the bobbins on this size job.

Mr. Hampton declared that the best bobbin-cleaning machine he had ever seen was one that operated by air, which he had investigated at the Pelzer Manufacturing Company. This one, he said, did not damage the bobbins and certainly stripped the bobbins clean.

The final point in this discussion referred to the machine rubbing the shellac off of the bobbin. Mr. Matthews raised the question that even if this was the case, was the shellac on the bobbin of any value.

Thread and Lap Waste.

The last question on the questionnaire asked "Do you keep a record of lap waste against each individual spinner,

R. J. Jennings, of Lanett Mill, West Point Manufacturing Co., Who Led the Discussion on Waste.

or take the room as a whole?" The unanimous written reply, the chairman announced, was to keep the record of the room as a whole. Mr. Hampton said that he had made several tests. "Our average number is 16s, he said, "and my spinners run eight sides, using about 2.25 hank roving, and the waste from the individual spinners runs between 3½ and 5 pounds. Sometimes we very often take the individual spinner and weigh her waste and then give the report to her. Some of the help will naturally take more pride in their work than others, and this helps influence them to reduce their waste. With 27 spinners it will average 4½ pounds to the spinner. That is every kind of waste—scavenger, roving, and every kind. I have separated it, and find that the scavenger waste is a little bit more than the roving waste."

Mr. Edwards brought up the question of waste percentages for the entire room. He said his lap waste runs .8 per cent, and his thread waste .3, including all the thread waste. He does not use warpers, his yarns being twisted.

"I have made a test for six weeks," said Mr. Hampton. "I weighted the waste from my spooler hands' fingers, and on a production of 100,000 pounds, that runs 55 to 60

pounds a week. Tangled spool waste runs from 40 to 41 pounds. Run-under bobbins will average 38 to 40."

Mr. Strange read his waste, for one week, as follows: Total production, 57,823 pounds. Average number, 14.96s.

Sweeps, 362 pounds	.6 per cent
Lap waste, 316 pounds	.5 per cent
Roving waste, 587 pounds	1.0 per cent
Hard waste (thread), 239 pounds	.3 per cent
Total	2.4 per cent

Spinning Room Humidities.

The last question brought up was asked by Mr. Strange. He wanted to know what the men with automatically controlled humidity, endeavored to keep in the spinning room, and how much variation they had. A number of men answered as follows, each figure representing the report of one man.

Standard 75 degrees with 2 degrees variation; standard 65 degrees, varying between 50 and 70; standard 80 degrees; standard 65 degrees with 2 degrees variation; standard 65 degrees varying between 63 and 70; standard 67 degrees; standard 60 degrees varying between 58 and 60; standard 65 degrees with 5 degrees variation; standard 65 degrees with 6 to 8 degrees variation; standard 65 degrees with 8 to 10 degrees variation; standard 80 degrees with 3 degrees variation. One man reported 65 degrees standard for warp and 60 degrees standard for filling, with a 3 degree variation in each case.

The discussion meeting was adjourned at this point and the usual "Dutch" luncheon was served following an exhibit by Mr. Davis, of Augusta, of some samples of sledded cotton. At the luncheon, Frank K. Petrea, superintendent, Swift Mfg. Co., Columbus, was elected as a member of the executive committee for two and one half years, succeeding John F. Long, whose term had expired.

CURRENT TOPICS

A New Industrial Monarch.

The chief cause of the filibustering confusion which marked, in the Senate, the closing days of the recent Congress was what in many of its aspects is a new force in national affairs, political and industrial. It is power, in its national, even international, eminence only recently attained. Along with coal and petroleum, power as an entity more or less distinct from its various sources has achieved a character little less than regal. King power now commands obeisance, arouses jealousies whets giant ambitions and foments gigantic rivalries as did all of the industrial monarchs upon first ascending their thrones.

Inanimate power is the base on which this industrial age has been developed. But until recent years it has partaken more of an incident or attribute than a pervasive foundation. This is because power was in the main a local quantity or one peculiar to each consumer. Now it is on the way to becoming as national and as general, in its origination and distribution, as is railway transportation.

Such is the result of tremendous expansion in the development of power resources and the perfecting of means for their distribution. This in turn is owing chiefly to the advances made in equipment for generating and transmitting electricity.

In up to date plants they are now getting from a pound of coal about 50 per cent more electrical energy than they did fifteen years ago. The greater part of the energy now generated still comes from coal. A rapidly growing proportion of the burden is being put on water. Since January, 1910, 7,800,000 horsepower has been brought into use from the streams of the country. Present development is at the rate of more than a half million horsepower a year. A total of about 60,000,000 primary horsepower may be developed. This only about equals the total of all prime movers of stationary power now in operation in the country. Water power can never take over the full burden.

The generation of power on big scale for sale alone is a relatively new thing, being made possible by the evolution of high tension equipment for distributing electrical energy over long distances from the producing plants. The industry has been among the ones of most rapid growth in recent years. Gross revenues from the sale of electrical energy rose from $336,950,000 in 1914 to $1,470,000,000 in 1925. It is one of the few things that were sold at a lower unit price in 1925 than in 1914. The industry now commands total capital aggregating nearly ten billions of dollars. New capital has been flowing into it at the rate of nearly a half billion a year. Since 1923 there has been a large increase in the amount of electrical energy sold for power or lighting.

Yet there are fewer concerns engaged in the business than in 1920. The total number has dropped from nearly 6,500 to fewer than 5,000. Interconnection of producing plants is essential to the highest efficiency in production and the best economy in distribution. Natural tendencies in no other industry make so much for consolidation of ownership, control and management. Eleven holding companies now control about half the business. One has properties in 21 states and Mexico. Another operates in 19 states and a third in 16 states. The total capitalization of enterprises controlled by one holding company is $1,384,000,000, nearly 15 per cent of that of all.

Only about five per cent of the electrical energy now generated for sale is transported across state lines. But expansion of big holding companies, with the interconnecting of plants often in many states, is giving the business more and more an interstate character. Many states regulate the power industry as a public utility. But the courts have held that state agencies cannot regulate that which is of an interstate nature. There is no Federal regulation, except in the matter of water power sites that are within Federal Government jurisdiction.

There is arising a demand for interstate power operations to be brought within Federal Government regulation in the manner that railroads are regulated now. And there is a demand, as of old, for government ownership and operation of power enterprises. This has had much to do with keeping Congress from making some permanent disposal of the Muscle Shoals development by the Government. Deep

seated jealousies and rivalries, aroused by the expansion of power as an industry, was one of the causes that brought about, anent the Boulder Dam controversy, the stalemate situation that caused the United States Senate to cease to be a deliberative body during the last few days of the recent Congressional session.

The power situation portends politically a repetition of the demagogy, groping, false moving and baiting on the part of theorists and politicians that attended the evolution of other giant industries which lend themselves to political meddling.

While these may retard and confuse, they will not prevent the continuance of great developments in the realm of inanimate power. It is estimated that the producing possibilities of developed power in this country is now equal to the work of thirty slaves on behalf of every man, woman and child in the land. It is to power that is most due the present remarkable social and industrial situation in this country. Not only has the use of inanimate power increased enormously but the yield from each unit also has grown through the expansion of labor saving machinery. Census figures show that increases in wages and in earnings have run along with growing use of power and of labor saving machinery. The kilowatt is taking the place of muscle. The turning of coal and water flow into electrical energy, which can be transported cheaply by wire over long distances, tends to equalize industrial advantages as between communities and sections.

While the rate of development has been biggest recently in this country, all the world is affected by the current fever for cheap power. The fever rages high in Europe, particularly in Scandinavia, Switzerland and Italy where there is much water power and little or no coal.

Congress Changes a Word.

In supplanting the word "emergency" with the word "merchant," Congress at the last session virtually adopted a principle that comparatively few people in this land of individual initiative approve. It is the principle of government ownership and operation of a branch of private business—and one that no government, no matter how socialistic, ever before thought it safe to take over permanently.

The name of the Emergency Fleet Corporation was changed to Merchant Fleet Corporation, as notice to the world that the Federal Government is in the shipping business to stay. The corporation is the Shipping Board in its function of ship operator. The change was made because it was claimed that shippers hesitate to use Shipping Board vessels on account of the belief that they are to be operated only temporarily and that this belief was accentuated by the word "Emergency" in the formal name of the fleet corporation.

Just how the mere change of a word can overcome that belief, which, if it exists, grows out of policies repeatedly proclaimed by the Government, is not made clear. In fact the reason given was only a pretense. What it means, as will be contended hereafter, is the adoption of a permanent policy of Government ownership and operation of merchant vessels.

This deduction is supported by resolutions introduced and speeches made by men who have been leaders in Congress on the subject of shipping. One of each came from Senator Jones of Washington, chairman of the Senate committee on commerce, and author of the present merchant marine act. Others were put forth by Senator Fletcher, ranking Democrat on that committee. Still others came from House leaders of like situations as to the shipping problem. All are for a definite program of permanency, including the construction of new as well as the operation of old ships. These leaders heretofore have pretended to be opposed to anything like a permanent policy of Government ownership and operation of the merchant marine.

It is needless to review the enormous expense and substantial futility of the temporary program of government ownership and operation that grew out of the war. There has been spent to date money enough to have paid the country's entire shipping bill for a quarter of a century or longer. Yet the merchant marine has receded and still is receding. There is nothing in the record to indicate that permanent adoption of past policies will yield anything except further enormous waste at the cost of the taxpayers. Here and there a port may be helped. Now and then a section may be aided in getting its goods transported abroad. Hundreds of millions of dollars will be distributed as political pork.

It is a reflection on the business element in America that the solution of the merchant marine problem is as far away now as it ever has been. And it is because this vitally interested element has refused almost absolutely to take any interest in the subject. By devoting to it for a period of six months one half as much interest as they give to golf, American business men could bring about a workable solution of one of the biggest, albeit most entrancing, problems having to do with the country's future.

Hobbling Trade.

Whatever one may think about the principle of tariff protection, no one can logically look with favor on petty obstacles in the way of free and easy trade when there is nothing to protect. A traveler who returned recently from a trip through eleven European countries says that the phenomena which impressed him as the most singular are the ways border-lines are treated as walls. Every little country seems to be operating on the notion that it can make itself strong and prosperous by rendering it difficult for the things it needs and must have from abroad to get into its territory. Adjoining countries make it equally difficult for the things which must be exported to get out.

International bankers put forth a joint protest recently against the multiplying of trade barriers which only hobble commerce between nations. These are not always in the form of tariffs on imports or exports. Many of the most annoying are of the nature of regulations and such things as port fees. These bankers, who should know, declare that foolish bothers and restraints have been retarding, more than all else, the full restoration of world trade.

Without involving the essential question of protection or free trade, it might be well for the business interests of the world to get behind a movement for removing every unnecessary obstacle in the way of easy trading between all the peoples of the world. Trade between nations is not an evil.

A New Type of Clothing for Cards.

A recent article by Professor Rimette of the Roubaix (France) Technical School describes a new type of card clothing and some tests made therewith, which it is believed will be read with interest by mill men in the United States as indicative of practices abroad.

For some years past great ingenuity has been displayed in devising automatic machinery for stripping or fettling carding engines, and it must be acknowledged that some of these processes give quite satisfactory results. But there is a better solution of the question, and that is the complete suppression of fettling or stripping. This problem was solved some two years ago by Messrs. Platt Freres, of Roubaix, says Professor Rimette, since which time the invention has proved its merits by numerous and conclusive experiments. The system consists in the use of a new kind of card clothing made with rigid needle points on a thin strip, about 1/32-inch, after the style of the serrated wire used on the lickers-in of worsted cards and the licker-in rollers of cotton cards. But instead of being saw-shaped teeth, the pins are much finer, and their number may be as dense as the wire points of ordinary card clothing. These

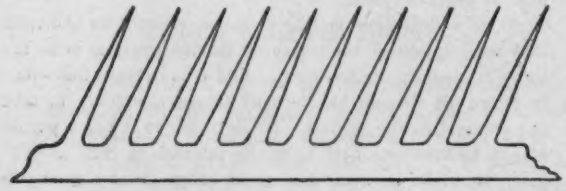


Fig. 1.

pins are straight—that is, without a knee—and are placed at the angle indicated in Fig. 1. This diagram is enlarged about five times. Actually, the new wire clothing has fifteen points or teeth per lineal inch. Another view is shown at Fig. 2.

The combined characteristics—that is, rigidity and absence of hook—appear to be the cause of the special prop-

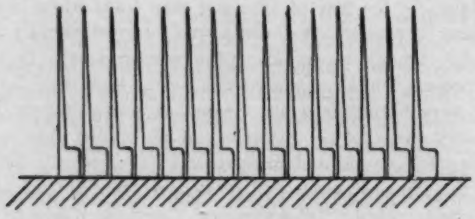


Fig. 2.

erties. The first trials were made on worsted cards. In the beginning all the organs of the card were covered with the new clothing. Later, experiments demonstrated that it sufficed to use it on the workers and doffers, the swifts remaining clothed with ordinary clothing. Latterly the wire clothing has been tried on cotton cards, the doffers only being covered.

The results, continues Professor Rimette, are nothing less than extraordinary. Not only the cylinder keeps clean, but its clothing remains much longer in working order and does not require grinding so frequently. A cotton card which had worked in this manner for a period of four weeks was stopped in order to examine the state of the cylinder. On cleaning the latter, a fine black dust only was removed without any cotton fibers.

It is scarcely necessary to point out the advantages offered by such a system as regards production and regularity of sliver. This is easily understood. On the other hand, it may be useful to answer here a question which is often raised. If the short fibers and impurities with which they are mixed do not remain on the cylinder, will they not be found in the sliver, and thence in the yarn? On the one hand, the fettlings represent only 0.5 per cent of the production of the card, and on the other, they contain a

Fig. 3.

large proportion of good fibers, more, for instance, than the waste from the flats. The objection, therefore, in the opinion of Professor Rimette, does not stand.

The makers claim that the reason why the clothing does not fill up is because the pins are made without hook or knee, unlike the old type of clothing set in fabric or leather foundation, which in working, they say, immediately fills up to the bend and then gradually up to the point. The teeth of the clothing being straight from the base, and made with needle-shaped points, the fibers under operation are not withheld, but are easily cleared with the doffing comb.

Professor Rimette thinks that something should be added to the foregoing explanation, namely, the rigidity of the clothing, which, in his opinion, is the main cause of the superior grasping power of the card. It appears to him that this property could easily be demonstrated, and that if correct, the speed of the doffer and production of the card can be increased. The question remains open, but there is no doubt that the discovery described is of great value not only from the practical point of view, but also as a lesson in the still obscure theory of carding.

Since this expression by Professor Rimette was written, progress has been made in the manufacture of this rigid metallic clothing. The points of this clothing are of hardened steel and set at about 500 points per square inch in most cases, which is suitable for the majority of the various qualities of cotton. It does not fill up with waste and does not want fettling, the seeds are brushed out with a burnishing brush every two or three months, according to the cleanliness of the cotton. For clean cotton no cleaning is necessary, it is claimed. The points, in working, become sharper. As they are never filled up with fettlings, the fibers slip down these points and this continuous polishing keeps them sharp, say the makers. This is the reason they need no grinding.

This metallic clothing is trued up once before leaving the hands of the fitters, the manufacturers advise, but if for any reason it is found necessary to true it up again, this can be done very lightly with a traveling grinding wheel exactly as is done with ordinary clothing. They further state that after four years of continuous work, day

and night, in a worsted combing mill, the points, instead of rounding off at the tips as happens with ordinary clothing, have become polished finer and sharper, and wear *under* the tip to nearly the bottom of the base, leaving the extreme tips intact, as shown at x in Fig. 3.

In several cotton mills in the North of France, it is pointed out, doffer clothing having worked for three years, double shift, which represents six years of continuous work, has never been ground after setting off.

An ordinary flexible clothing is generally set at 5/1000 inch and more, because the foreman, in setting his card, slips the gauge between the rollers, when empty or clean, but as soon as the card works, the needles are drawn or pulled by the fibers and this lifts up the teeth and brings the carding points nearer together. The accompanying sketch, Fig. 4, shows this theory as explained by Messrs.

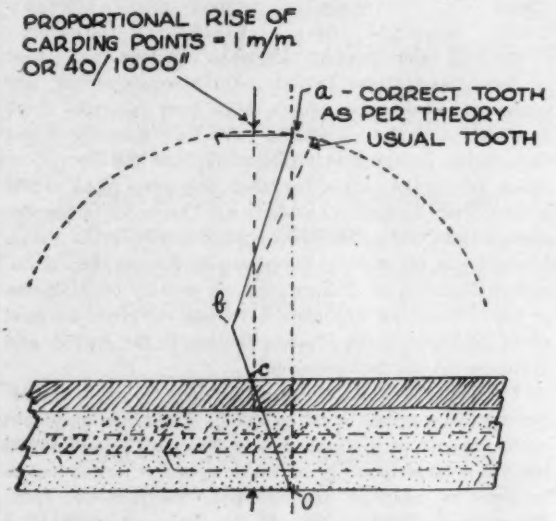


Fig. 4.

Platt Freres. It will be seen that if the needle in working, turns around the center *O*, its point, *a*, will be at its maximum height, but the thickness and rigidity of the cloth opposes this movement, and if it is around the center *C*, that is on the surface of the cloth that the needle will oscillate. This movement will be equal, for a well-made clothing, to 5/1000 inch, but generally very much more hook is given at *b*, and in this case the fault is greater. It will be seen that the points of a clothing are forced to become nearer and most probably to meet.

If a carding engine is suddenly stopped, it will be seen, they claim, if carefully examined with a magnifying glass, that 60 per cent of the points have hooked cotton, which appears to prove that it is only the points which are pulled up that are working. The points that don't work, that is 40 per cent, are seen in bare spots of about 1¼ inch and distributed over the surface of the cylinder. As the teeth of the new type clothing are rigid they will not work into one another, it is stated, and all the points will be in full working order. One cotton mill is said to have 100 doffers set at 3/1000 inch.

While most of the foregoing description has been devoted to doffers, the makers claim that it applies also to the other card parts. In other words this clothing may be used on the whole card.

This clothing and its application to carding engines is patented in the United States and all important countries.

Twist Variation Tests and Tensile Strength Tests as Made for The Arkwrights, Inc.

The research committee of The Arkwrights, Inc., has approved two further tests of applicants. Test Number Five, prepared and submitted by Stanley A. Black, night superintendent, Mill No. 3, The Lancaster Cotton Mills, Lancaster, S. C., was a comparative test to determine the percentage variation in turns per inch in plied yarns made on tape and band driven twister spindles. Test Number Six was prepared and submitted by Richard W. Arrington, superintendent, Union Bleachery, Greenville, S. C., and covered the subject, "Determination of gain or loss in tensile strength of cotton piece goods, due to various operations in a chlorine bleach."

These applicants have been admitted to membership in The Arkwrights, Inc. The first four members' tests were published in the January number of COTTON. Summaries of the tests made by Mr. Black and Mr. Arrington follow:

SUMMARY OF TEST NUMBER FIVE.

Prepared and submitted by Stanley A. Black, Night Superintendent, Mill No. 3, The Lancaster Cotton Mills, Lancaster, South Carolina.

A comparative test to determine the percentage variation in turns per inch in plied yarns made on tape and band driven twister spindles.

The object of this test was to determine the variation of twist in different bobbins from tape and band driven twister spindles.

The method used in making this test was as follows: I took eight hundred bobbins, four hundred from tape driven spindles and four hundred from band driven spindles, then ten inches of yarn was taken from each of these bobbins and the turns per inch found with a ply yarn twist counter.

The yarn used in making this test was 8's warp yarn twisted into three ply.

A summary of the data sheets from the two tests; one from four hundred bobbins from tape driven spindles, and one from four hundred bobbins from band driven spindles, were as follows:

Tape Driven Spindles	Band Driven Spindles
330.1	323.3
325.8	313.3
329.5	318.3
325.5	322.3
321.9	324.5
325.1	314.8
319.2	325.1
322.6	322.6
291.8	301.3
292.0	298.4
3,183.5	3,163.9

RESULTS

$\frac{3,183.5}{400}$ = 7.95 Average turns $\frac{3,163.9}{400}$ = 7.91 Average turns

	Tape Driven Spindles	Band Driven Spindles
Average turns per inch	7.95	7.91
Highest turns per inch	9.00	9.20
Lowest turns per inch	7.00	6.20
Turns variation	2.00	3.00
Percentage variation	25.1%	37.9%

Percentage difference in tape and band driven spindles 12.8%.

REMARKS

The foregoing observations were made over a period of several weeks and the tests were made in parallel. That is, an equal number of bobbins from both types of spindles were tested during the same day.

From the results thus obtained we have a variation of 2 turns or 25.1% with the tape driven spindles, and a variation of 3 turns or 37.9% with the band driven spindles.

Therefore we find 12.8% turns variation more with band driven spindles than with tape driven spindles.

The above test is submitted as the findings from this applicant. The results are not intended to be conclusive, as we expect to compile numerous similar tests from others in different sections and under different local conditions to arrive at a conclusive result before announcing a definite conclusion.

Criticism and suggestions of the methods used in making this test will be welcomed by The Arkwrights.

SUMMARY OF TEST NUMBER SIX.

Prepared and submitted by R. W. Arrington, Superintendent, Union Bleachery, Greenville, S. C.

Determination of gain or loss in tensile strength of cotton piece goods due to various operations in a chlorine bleach.

In making my determination I have taken five fabrics which I consider representative of a general line of cotton piece goods. Those five fabrics are the following:

30" 2.31 Twill
39" 96/64 3.10 Jean
37" 100/60 4.10 Broadcloth
36½" 72/80 4.70 Pajama Check
38½" 64/60 5.35 Print Cloth

In order to secure figures which I considered representative and to show a true comparison, I have taken on each fabric one piece each from six different bales. These pieces in each case have been marked and a sample taken from the same end of each piece after the different operations. All of these samples were dried up after each operation and held until the entire number was available for testing. I feel by doing this that the test on each one was as

nearly the same as could be obtained. Each sample was broken five times both warp and filling ways, therefore, each figure shown in the attached tables represents an average of thirty breaks; this being, of course, five breaks each on six different samples. The processes used in the bleaching were those common to a regular chlorine bleach and were as follows:

Grey Sour and Wash
Kier Boil and Wash

A 3 per cent solution of caustic soda was used and the goods boiled for 12 hours in a pump and heater kier with ten pounds pressure.

Chlorine Bleach and Wash
White Sour and Wash and Water Mangle
Starch and Dry
Calender

Following will be found the determination concerning each fabric:

30" 2.31 TWILL

	Breaking Strength Warp	Breaking Strength Filling	% Loss in Warp From Grey	% Loss in Filling From Grey
Grey Sample	139.7	85.7	---	---
Grey Sour and Wash	129.4	82.5	7.36	3.74
Kier Boil and Wash	119.4	92.7	14.52	8.18*
Bleach and Wash	107.8	84.8	22.85	1.05
Sour and Water Mangle	121.7	78.9	12.90	7.93
Starch and Dry	118.7	77.7	15.05	9.34
Calender	114.8	72.7	17.85	15.18

*Gain

39" 96/64 3.10 JEAN

	Breaking Strength Warp	Breaking Strength Filling	% Loss in Warp From Grey	% Loss in Filling From Grey
Grey Sample	97.50	35.7	---	---
Singe, Diastafor and Wash	98.13	34.3	.65*	3.92
Grey Sour and Wash	94.9	33.6	2.67	5.88
Kier Boil and Wash	101.4	39.97	4.0*	11.93*
Bleach and Wash	74.6	34.48	23.5	3.42
Sour and Mangle	84.0	33.06	13.85	7.4
Starch and Dry	87.94	31.8	9.82	10.91
Calender	89.4	31.3	8.32	12.32

*Gain

37" 100/60 4.10 BROADCLOTH MERCERIZED

	Breaking Strength Warp	Breaking Strength Filling	% Loss in Warp From Grey	% Loss in Filling From Grey
Grey Sample	66.9	27.9	---	---
Singe, Diastafor and Wash	62.7	27.5	6.27	1.43
Grey Sour and Wash	64.2	26.8	4.04	3.94
Kier Boil and Wash	66.4	28.8	.74	3.23*
Mercerize and Wash	64.5	25.8	3.59	7.53
Bleach, Sour and Mangle	63.9	25.3	4.49	9.33
Starch and Dry	62.9	18.4	5.98	34.05
Calender	56.6	18.1	15.40	35.10

*Gain

38½" 64/60 5.35 PRINT CLOTH

	Breaking Strength Warp	Breaking Strength Filling	% Loss in Warp From Grey	% Loss in Filling From Grey
Grey Sample	45.1	31.5	---	---
Singe, Diastafor and Wash	39.7	29.6	11.95	6.03
Grey Sour and Wash	31.07	19.8	81.0	38.4
Kier Boil and Wash	46.37	30.8	2.82*	2.22
Bleach Sour and Mangle	38.8	26.1	13.96	17.7
Starch and Dry	46.9	28.0	4.00*	11.1
Calender	43.53	28.07	3.44	10.9

*Gain

36½" 72/80 4.70 PAJAMA CHECK

	Breaking Strength Warp	Breaking Strength Filling	% Loss in Warp From Grey	% Loss in Filling From Grey
Grey Sample	44.07	35.4	---	---
Singe Diastafor and Wash	48.3	33.9	9.6*	4.24
Grey Sour and Wash	43.17	32.57	2.02	8.00
Kier Boil and Wash	50.0	34.6	13.46*	2.26
Bleach Sour and Mangle	38.0	21.7	13.75	38.70
Starch and Dry	50.4	29.1	14.35*	17.80
Calender	46.2	32.5	4.83*	8.20

*Gain

CONCLUSION

A loss in tensile strength of 10 per cent due to bleaching is usually considered not to be excessive. A study of the foregoing figures shows a very wide variation both upward and downward from 10 per cent. The figures on the various operations also show a wide variation in results. The only operation which showed anything like a consistent figure was the operation of kier boiling and washing, which showed in each case a consistent gain. This is to be expected with this operation. On other operations where normally one would expect a gain, such as the operation of starching, the figures show in several cases a loss. Also the operation of calendering showed usually a loss. Generally speaking the tensile strength due to the bleaching operations alone did not show an excessive loss.

The above test is submitted as the findings from this applicant. The results are not intended to be conclusive, as we expect to compile numerous similar tests from others to arrive at a conclusive result before announcing a definite conclusion.

We welcome criticism and suggestions of the methods used in making this test.

W. W. McLEOD has become superintendent of the Oakland Mills division of the Kendall Mills, Inc., Newberry, S. C.

American Textile Trade with China.

BY B. Y. LEE.

The importance of American textile trade in China has been marked only in recent years. The trade consists of cotton piece goods, raw cotton, as well as knitting, cotton spinning, and weaving machinery, textile mill supplies and lubricating oil, and the control and operation of textile mills. Since 1923 the Americans have begun to act as trustees for three large cotton mills. The trade of American cotton piece goods is the oldest item in the list and the following figures show the value in taels imported in recent years:

1916	1,753,500	1921	2,961,586
1917	441,160	1922	2,180,488
1918	690,674	1923	384,817
1919	2,116,235	1924	672,746
1920	2,173,100	1925	1,310,756

America ranks third in this trade in China, being next to Japan and Great Britain. Only comparatively fine grades of cotton piece goods have been imported from America, while the low grades have been either imported from Japan or supplied by domestic mills for the poorer classes among the people, for whom cheapness in an article is very often the first consideration. The width of the imported American cotton piece goods, usually of 32 inches, does not suit the taste of the people here while that of imported Japanese or British goods is usually of 24 inches or less. American exporters have not yet given as good credit facilities to the Chinese dealers as the British and Japanese merchants have done.

The imports of American cotton into China varies according to its price. Most cotton mills in China only spin low counts of yarn, from 10's to 16's mostly, and would not use a large quantity of the long staple cotton unless its price is cheap or fine counts of the yarn are spun. The price of American low middling delivered ex wharf at Shanghai has been usually from 5 to 10 taels per picul higher than that of local cotton. In this season as it is reported about three quarters of a million bales of American cotton would be imported because its price is only from 2 to 5 taels per picul higher than that of Tunchow grade. The following figures show the amount of American cotton in piculs imported into China during the past years:

1913	134,735	1920	678,297
1914	126,488	1921	516,676
1915	364,390	1922	155,319
1916	407,644	1923	150,500
1917	300,128	1924	146,810
1918	190,110	1925	235,000
1919	239,000		

The import of American textile machinery constitutes a large percentage of the American textile trade in China. The first automatic seamless knitting machines were introduced into Hong Kong in 1900 by the "Banner" company, an American machinery manufacturer, who employed a Chinese returned student to act as its agent. At present Hong Kong including Canton has in operation about 1,000 automatic machines and Shanghai including its neighborhood has about 900 American knitting machines. The makes are Scott & Williams, the "Banner" and the "Brinton" and they are represented by Andersen, Meyer & Company, the Elebrook Inj, and the Wha Chung Trading Company. It is often said the knitting factory in China is purely an American institution because practically all ma-

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chinery and methods of management of these factories were introduced from America.

The American spindles were first introduced into China in 1918. The Hou Sung Cotton Mill, in Shanghai, and the Wha Shing Mill in Tientsin, ordered their machinery through Andersen, Meyer & Company in 1917 and began operation in 1918. Since then about one million and a quarter of American spindles are in operation in China including about 100,000 in the Japanese owned mills. The machinery makers are Saco-Lowell, Whitin, and the Mason shops and they are represented in China by Andersen, Meyer & Co., the Elebrook Inj, and the Wha Chung Trading Company. The following figures show the value in taels of American textile machinery imported into China in recent years:

1922	6,087,336 taels
1923	890,816
1924	605,068

During the past few years the cotton mill industry has been dull and the import of the textile machinery has temporarily declined. About 5,000 power looms out of 23,000 in operation have been imported from America.

The imports of cotton mill supplies, on the average, a year amounts to about one million dollars. More than 50 per cent of the imported lubricating oil for cotton mill use also comes from America. Three American firms, the Standard Oil Company, the Vacuum Oil Company and the Texas Company share the business. The tael value of the lubricating oil imported into China in recent years is as follows:

1922	2,090,415
1923	2,387,261
1924	2,649,764
1925	1,509,591

American participation in the operation of textile mills in China is divided into two kinds. The Elebrook Company has lately become interested in the carpet factory and Andersen, Meyer & Company is interested in the cotton mill, each acting as trustees. The following are a list of factories of the Elebrook Company:

Location.	Invested capital
Tientsin, Elebrook Carpet factories, No. 1, 2, 3	$1,000,000
Shanghai, Elebrook Carpet factory No. 1.....	300,000
Tientsin, Elebrook Spinning Mill	500,000

No. of Operatives	Years Established
1,000	1922, 1923 and 1924
300	1924 (reorganized)
100	1924

The product of these factories is only for export, especially to America. The Elebrook Spinning Mill only spins woolen yarn to supply these carpet factories.

Andersen, Meyer & Company now act as trustees for the following Chinese cotton mills:

Name and Location	No. of spindles	No. of looms	Capital
Paocheng No. 3, Tientsin.	50,000	200	$3,000,000
Yu Foong, Chengchow, Honan	51,480	200	2,000,000
Chiu Shing, Kiukiang, Kiangsi	15,360	300	1,000,000

The above mentioned mills had ordered their machinery when the cotton mill industry was at the zenith of its prosperity and when the foreign exchanges rates in terms of the silver dollar were favorable. Unfortunately the depressed yarn market came too early and this caused these mills to fall into a difficult position. Part of the payment due to Andersen, Meyer & Company on the machinery purchased has not yet been fully met and the latter temporarily act as trustees for these mills and will eventually give them back to the owners when the debts are fully paid.

What the Southern Mills are Doing.

An announcement from Georgia of general interest was that the American Textile Company, now operating a 32,000-spindle, 800-loom plant at Ateo, near Cartersville, Ga., would immediately begin work on a 17,000-spindle, 500-loom addition. The new building will be four stories, 125x250 feet. In addition, approximately 100 houses will be added to the village and a new opener building and several warehouse sections built. The additional productive equipment will be utilized to expand the company's present production of drills, sheetings, osnaburgs, etc. Approximately $1,000,000 will be expended in the development. Robert & Company, Inc., Atlanta, Ga., are the engineers.

Bibb Manufacturing Company, Macon, Ga., have let contract for an addition to Mill No. 1, in East Macon. It will be 200x18 feet, and will constitute an enlargement of one of the main buildings to permit the re-arrangement of machinery, it is announced.

Fitzgerald Cotton Mills, Fitzgerald, Ga., will double the capacity of the plant, according to announcement by R. T. Fish, of Hunter Manufacturing & Commission Co.,

A Corner of the Mill Village, Martha Mills, Thomaston, Ga., Showing Fire-Resisting Roofs.

vice-president of the mill, who recently visited Fitzgerald. The mill now contains approximately 11,000 spindles and 200 looms.

Seaboard Silk Mills, Elberton, Ga., manufacturers of broad silks, recently started operations with an equipment of 216 looms. The main building is two stories, 70x370 feet. Robert & Company were the engineers for the construction work.

Trio Manufacturing Company, Forsyth, Ga., have made an addition to the plant which will increase the production.

An addition to cost $14,000 will be made to the textile mill of the U. S. Penitentiary at Atlanta, Ga., it is understood from a report.

Aldora Mills, Barnesville, Ga., have added 36 new cards and nine roving frames to replace old machinery.

Swift Spinning Mills, Columbus, Ga., are installing the Cocker double type ball warpers.

Chicopee Manufacturing Co., which have a plant under construction at Gainesville, Ga., are experimenting in the raising of long staple cotton in the Hall County section of

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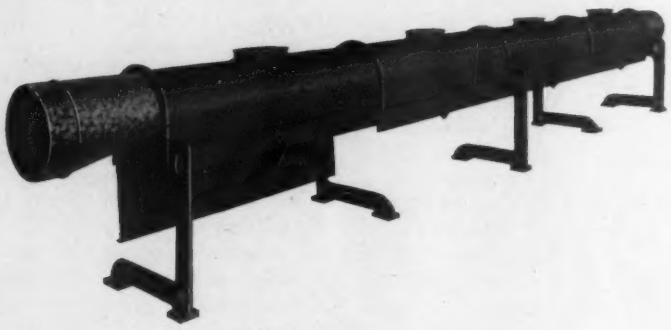

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Georgia. The company has purchased the seed, equipment and fertilizer, which will be furnished to four farmers. Each farmer will set aside a 40-acre tract for the purpose of raising the cotton, keeping account of all expenses and paying back the seed. The cotton will be the Acala long staple.

The M.L.O.E. Club, composed of the superintendents and overseers of the Monarch and Ottaray plants of the Monarch Mills, and the Excelsior Mills, at Union, S. C., and the Lockhart plant of the Monarch Mills, at Lockhart, S. C., held its annual meeting at the Monarch mill community building Friday night, March 11. C. W. Cain, of Excelsior Mills, president of the Club, presided. John S. Lockman, of the Lockhart Mills, is secretary-treasurer. The second hands of the mills were special guests of the superintendents and overseers, and the local ministers also were invited guests. A wholesome meal was served, after which Mr. Cain, T. M. McNeell, John S. Lockman, and others, made brief talks.

It is announced that $20,000,000 will be spent in a hydro-electric development on the Saluda River, ten miles east of Columbia, S. C. This will develop 200,000 horsepower, it is understood, and will be the second largest hydro-electric plant in America. It will be constructed by the Lexington Water Power Company of Columbia, S. C., backed by the W. S. Barstow Company of New York City.

Fairmont Manufacturing Company, Fairmont, S. C., has been purchased by the Union-Buffalo Mills Co., of Union, S. C., it is announced by H. B. Jennings, vice-president of the purchasing company. The financial consideration was more than $300,000. No change in policy or operation is planned. The Fairmont plant contains 12,600 spindles and 328 looms, manufacturing print cloths.

Ware Shoals Manufacturing Co., Ware Shoals, S. C., are considering the construction of a 30,000 spindle mill, to cost approximately $1,000,000, according to report. It is understood that the manufacture of handkerchief goods is under consideration.

It is announced that 200 looms will be removed from the Pelzer (S. C.) plant of New England Southern Mills to the Tucapau (S. C.) plant; wider looms being used to replace the ones removed at Pelzer.

Greenwood Cotton Mills, Greenwood, S. C., have let contract for an addition 75x50 feet, two-story, in which 5,000 additional spindles will be installed, and the present machinery also will be re-arranged. Also, an engine room will be built. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

An extension to permit the re-arrangement of machinery is being constructed by the Manetta Mills, Lando, S. C.

A new community building is practically finished in the village of the Newberry Cotton Mills, Newberry, S. C., where considerable work in the way of sewerage system installation is going forward.

It is understood that the Alma Mill, Gaffney, S. C., will install 5,000 additional spindles to balance up the equipment.

Fort Mill Manufacturing Co., Fort Mill, S. C., has placed a large electric sign, reading "Fort Mill Wide Sheeting" on the roof of the No. 2 Mill. The sign is visible to passing trains on the Southern Railway, and also to motorists on the highway. The sign is 80 feet long and 4½ feet high.

Twenty additional looms for the manufacture of damask are being installed at the Marsh Cotton Mills, Salisbury, N. C.

The cotton mill of Morgan & Hamilton Company, Nashville, Tenn., will be equipped with eight new cards, and new picking, drawing and roving frame machinery. All looms have been replaced with new equipment.

Elmira Cotton Mills, Burlington, N. C., were bid in by W. T. Cheatham, a member of the E. C. Holt firm of cotton brokers, for a price of $130,000.

Theis Dyeing & Processing Co., Belmont, N. C., has been organized for commercial dyeing and processing of cotton and rayon yarns. It will have a weekly capacity of 100,000 pounds. A. C. Lineberger and B. E. Geer are interested. The Theis process of dyeing, developed in Germany, will be used. George W. Steiger, the American representative, is a director in the new company.

Ronda Cotton Mills, Ronda, N. C., have been taken over by a new company known as the Wilco Mills. T. W. Church, J. L. Poplin, R. L. Hickerson and others, of Ronda, are the owners.

Dover Mills Co., Shelby, N. C., will erect 24 new residences for employees.

Arista Mills Co., Winston-Salem, N. C., are building 35 new houses in the village.

Fifty looms are being added to the Alexander Manufacturing Company, Forest City, N. C.

A dyehouse is to be added to the Golden Belt Manufacturing Company, Durham, N. C.

Collins & Aikman Co., 25 Madison Ave., New York City, are understood to have taken over the Mills of A. T. Baker & Co., Roxboro, N. C., and will manufacture velours, it is understood.

A 10,000-spindle yarn mill will be erected at Andalusia, Ala., by Moore & O'Neal, purchasers of the equipment of the Park Cotton Mills, of LaGrange. A one-story, standard mill construction building, will be erected. E. S. Killebrew, of Albany, Ga., is the engineer.

American Net & Twine Co., Blue Mountain, near Anniston, Ala., will erect a two-story addition, with 15,000 square feet of floor space, to the No. 2 mill; and an addition with 6,500 square feet to No. 1 mill. No plans are included for enlarging the village.

It is understood that the Russell Mfg. Company, which recently put in 300 looms on pajama checks, will also manufacture shirtings, and have purchased 650 additional looms for this purpose.

Dixie Mercerizing Company, Chattanooga, Tenn., will install equipment for dyeing warps with vat colors under the Scotch system. The machinery is being furnished by the Cocker Machine & Foundry Co.

Roundtree Cotton Mills, Magnolia, Miss., have resumed operations, after three years of idleness. The J. A. Roundtree interests recently acquired the property from the former owners and placed it in condition for operation.

New England Mill Situation.

Improvement has continued in the New England cotton mill situation. Other textiles are not doing so well, notably the woolens and silks. The most striking improvement reported is in the finishing industry where leading plants are now being operated to capacity on printed and bleached goods and on some of the dyed fabrics. The rush of business in the past five or six weeks has been quite extraor-

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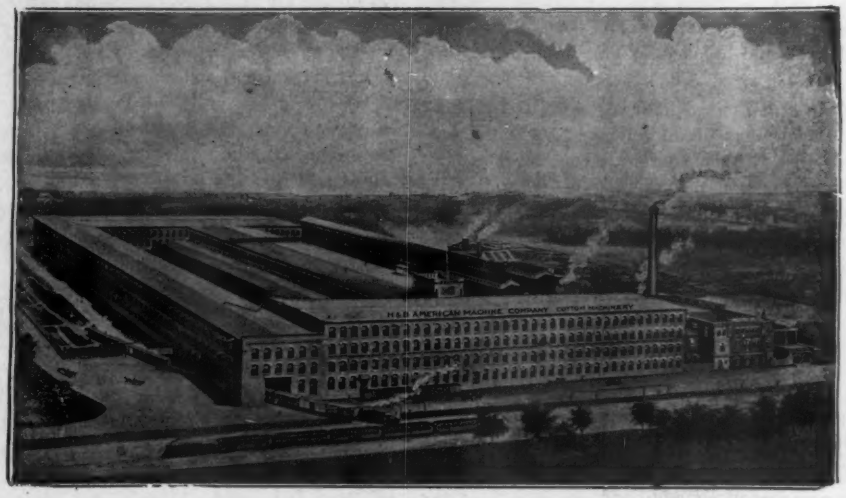

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dinary and it now bids fair to continue into May as the depletion of retail and wholesale stocks of fine cottons was undoubtedly greater than was commonly believed to be the case.

The greatest measure of gain has been made in the combed yarn end of the industry. New Bedford mills are running to capacity save those that are closed because of the change in the character of yarns and fabrics wanted by the automobile trades. The revived demand has been more comprehensive than anything seen in a long time, shirtings, voiles, pongees, and other staples being wanted, at the same time that there is a very active demand for dimities, silk and cottons, rayon mixtures and strictly seasonable specialties. Lawns, batistes, and some other plain goods have sold well and broadcloths have been in full demand.

The activity in rayon mixed lines is the greatest on record to date. Rayons have been advanced from the low point and rayon goods of some sorts are commanding most unusual premiums for spot deliveries. The plain rayons, wanted largely for printing and underwear purposes, command a premium as great as 4c a yard over goods available for deliveries beginning in May. Many of the silk and cotton goods have become profitable for the first time in more than a year but spot goods are very scarce owing to the refusal of mills to accumulate cantons, tussahs, or crepes. Some mills are using rayon on more than half the goods they are making, chiefly as decorations. But many all rayon cloths are also being made.

The gain that has been made in Fall River has not yet stimulated sufficient interest to induce stockholders in some mills to put in new money for additional equipment. Consequently the stock in process in the Chace mills is being run out, a treasurer who re-started the plant having resigned after it was determined not to furnish the money asked for new machinery. One of the two Stafford mills is running in full and the Mechanics and Weetamoe mills have combined and will be operated by the same management. The Seaconnet mills that have been idle for a year or two have been sold by the city of Fall River for taxes, and the buyers included a New York converter and a local dealer in machinery. A 72,000 spindle mill with more than half the looms automatic, will have been secured for less than $500,000 when all the expenses required in re-starting the plant on a sound basis have been met.

Because of the overtime operations in many mills, it is estimated that Fall River is running to 75 per cent capacity despite the many idle plants existing there. A few days ago the bondholders of the Ancona Company, 40,000 spindles, decided to take over the property. It was modernly equipped at great cost a few years ago, more than $500,000 having been spent on new spininng, carding, and other machinery, including Crompton & Knowles and Draper looms. The original owner of the property, George D. Flynn, having died, his heirs declining to operate the plant and it was allowed to fall into the hands of creditors.

In New Hampshire the Nashua mills are running to capacity, together with the large Jackson mill, a part of the plant. The Amoskeag Company is operating about 65 per cent capacity in its cotton goods department, and in full in its worsted department of 1600 wide looms. No increase is to be made to the rayon plant built by this company, it having been demonstrated just what may be done in the event that it seems wise later on to recast the whole character of the output.

This company has been linked with all sorts of rumors concerning combinations with large southern and other eastern plants but they have no further foundation than the fact that the stock of the company has been active and has been selling at rising prices.

The New Hampshire legislature refused to enact a 48-hour law and also refused to abolish the system of taxation in the State whereby stock in process and stock in hand are taxable in addition to the usual taxes on raw materials. After the matter was voted down, pressure was brought to bear on the legislators to reconsider to the extent of permitting the introduction of a bill looking toward exemption from taxation for a given period, any plant of an industrial character seeking to locate in the state. All through New Hampshire the electorate is aroused to the necessity of ceasing to bait mills and overtax them. Mayors in two cities, and voters in small villages holding town meetings have gone on record favoring close economy and a lessening of mill taxation wherever possible.

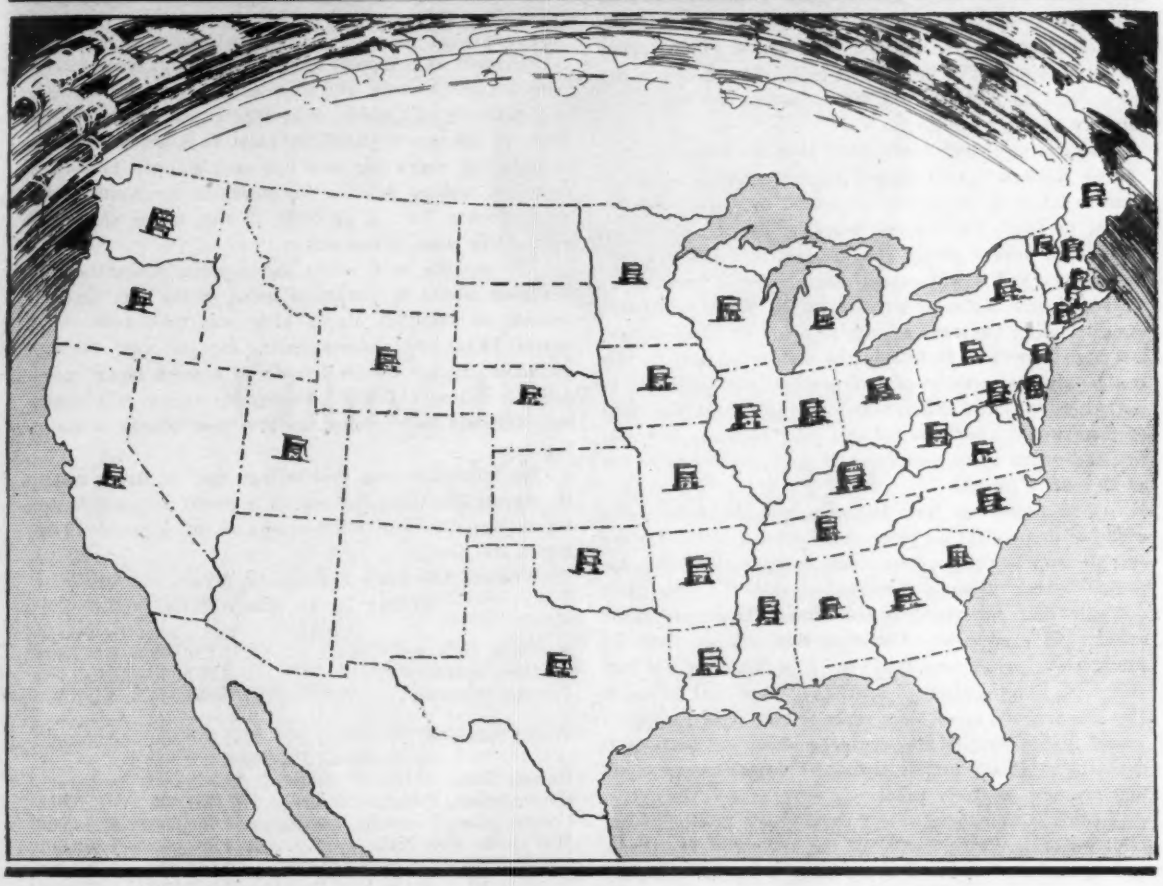
The same thing has been happening in Massachusetts and Maine manufacturing centers. There is no doubt that the people of New England are finally aroused to the folly of taxing mills unfairly, besides restricting their earning power by the adoption of welfare legislation far in advance of anything attempted elsewhere.

In Lowell, Mass., permission has been given for a sale of the Hamilton property which has been in financial trouble for months. The sale of the Tremont and Suffolk to the men closely allied with the selling agency of Amory, Browne & Co., and the Nashua plant of New Hampshire, has been followed by a resumption of operations in some of the plants. Part of the purchase was sold to the Merrimack Company. The Massachusetts mills, purchased by the Pepperell Company are running nearly full.

The situation in Rhode Island has a difficult spot in the strike at the Manville-Jenckes mills in Woonsocket and Manville. After having failed to arrive at an agreement with workers whereby working and wage changes might be made to enable the company to compete with other concerns, one of the plants was shut down completely and may not be started again. A second was closed indefinitely, and a third is running partially. The United Textile Workers have entered into the controversy and a strike has been inaugurated, the curious feature being that it started after the mill had been closed. Reports that some of the plants will be moved South are in circulation. The company already owns one southern plant that is doing well.

The finishers in New England are exceptionally busy, the Sayles, Glenlyon, United States Finishing, Bradford, Cranston, Greenwich, and other works being run overtime in several departments. Recently the finishers have begun to advance prices. They are now operating more machinery than at any time in three years. Connecticut mills are running in full as a rule. The plant of the American Thread Co., at Willimantic, where a strike was in progress for months is now operating satisfactorily.

In Maine, recently, the Mayor of Lewiston made it known publicly that he was opposed to the imposition of more taxes on cotton mills in that city and favored an immediate reduction in municipal expenses and a revision of valuations. He pointed out that the Bates, Hill, Continental and other plants in that city could not withstand competition if the city overtaxed the plants or permitted re-



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strictive measures to be applied to the companies. Stirrings of a similar spirit are reported at Biddeford. Me., where the Pepperell plants are located.

It has not yet been decided what action will be taken by the stockholders of the Everett mills of Lawrence on the proposition to pay in $700,000 to restore the borrowing capacity of the company.

There is no longer much doubt that the changed spirit of New England toward its mill properties will bring about a resuscitation if the present improved conditions last for a year or two. The current belief is that the cotton industry will have a steady run of good business well into the summer and it will extend much longer if there is no marked change in the basic cotton price. While many men are attributing the great activity to many different causes, the more important factors in the cotton industry in this section say the measure of improvement can be traced to low priced cotton. Other causes have operated but none of them would have changed this year from the last season, had cotton again come in at 20 cents, instead of as low as 12 cents a pound.

At no time were New England manufacturers as a whole so despondent on price prospects for cotton for the current crop as many others closer to the cotton fields appeared to be. Results are showing that the very great domestic consumption, plus the already large export of cotton, will prevent any carryover that will seriously depress cotton prices next fall, even if a large yield is harvested. By "seriously depressed" they mean that cotton at 15 cents a pound is not dear while cotton under 13 cents a pound in the next month would be about as cheap as it ought to be, if any of the downward changes occur at all, that are now so freely predicted.

In this section there was of course some talk of "What shall we or can we do with all the cotton?" The events and figures prove that mills are using it up more rapidly than ever before in the history of the industry, not even excepting the one war year when over 7,000,000 bales went into use to provide heavy war goods. Foreign buyers regard cotton prices as low and attractive, and they have been absorbing all they can finance. Should another year of medium priced raw material be ahead New England manufacturers believe they can say with confidence that the worst of their after war depression is behind them

Cotton Comment.

BY H. AND B. BEER.

New Orleans, March 16th, 1927.

Notwithstanding the vetoing of the McNary-Haugen farm relief bill, the cotton market scored a further advance of about $4 per bale, due to the continuance of large exports from the United States, especially to Japan, India and Russia, to partly make up for the smaller East India and Chinese crops, which, all told, are estimated at about 1,300,000 bales less than last season's production.

Of late, however, there has been a falling off in the demand for spots at Liverpool and in the South, in consequence of which there has been much realizing by longs, which resulted in a sharp decline, about all of the advance that took place during the last half of February having been lost, leaving the market today at about the same level of prices as prevailed one month ago.

EXPORTS FROM THE UNITED STATES, EXCLUSIVE OF CANADA.

Bales—	This season	Last season
Since last Friday	222,000	131,000
Since August 1st	8,047,000	6,061,000

Inasmuch as prospects are for the continuance of large exports from America, and since exports thus far this season, exclusive of Canada, total slightly more than for the whole of last season—8,047,000 bales vs. 8,008,000, the surplus of last year's big crop has been shipped to foreign countries, making it likely for stocks in the South at the close of next July to be little, if any, larger than they were at the close of last season.

The rapidity with which this season's enormous crop has been moved to market is noted in the fact that the amount marketed to March 11th was 16,064,000 bales against 14,116,000 to corresponding date last year. Because of indications for the continuance of a large export movement, it follows that the movement to market will remain comparatively heavy, which would reduce interior stocks all the more.

The large American mill takings and the larger domestic consumption than last season is partly responsible also for the rapidity with which stocks of cotton are diminishing in the South.

WORLD'S SPINNER'S TAKINGS OF AMERICAN COTTON, AUGUST 1ST TO MARCH 11TH.

Bales—	This season	Last season
Northern mills and Canada	1,727,000	2,093,000
Southern spinners	3,973,000	3,613,000
Foreign spinners	6,056,000	5,199,000
World spinners	11,756,000	10,905,000

CENSUS REPORT.

United States— Bales—	This-season	Last season
Consumption, Feb., inc. linters	651,000	625,000
Consumption, 7 months, inc. linters	4,480,000	4,214,000
Mill stocks Feb. 28th	1,933,000	1,833,000
Stock in public storage Feb. 28	5,444,000	4,740,000
Total stock in U. S. Feb. 28	7,377,000	6,573,000
Active spindles during Feb.	32,872,000	33,009,000

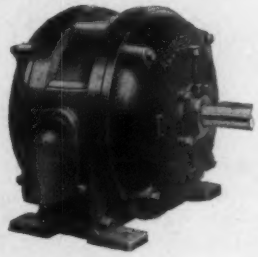
WORLD'S VISIBLE SUPPLY.

March 11th— Bales—	This year	Last year
American cotton	6,384,000	4,317,000
Other kinds	1,625,000	1,777,000
All kinds	8,009,000	6,054,000

As to the outlook for the new crop, farm work is somewhat backward in the Southwest, but is well advanced in the Southeast. There is a good season in the ground, particularly in Texas, but sales of fertilizer to February 28th were about 35 per cent smaller than to the same date last year, and while there will likely be a good reduction in the acreage, the reduction, it is generally believed, will not be as great as it was thought it would be earlier in the year, the marked recovery in price from the season's low level last December having altered this feature of the situation. Meanwhile the trade is anxiously awaiting the release next Monday, March 21st, of the Census Bureau's final returns covering ginnings for the whole of this season. It is generally thought that returns will be somewhat smaller than the government's December estimate for a yield of 18,618,000 bales of 500 pounds gross weight.

The Atlanta office of S K F Industries has removed dow display on Peachtree Street, are now being occupied. larger quarters, affording office space, store room, and window display on eachtree Street, are now being occupied. Nils Miller is district sales representative.

TEXACO—"For Dependable and Economical Lubrication"—TEXACO



Oiling them *Regularly* is *NOT* enough!

While it is true that all electric motors used in the Textile industry are designed to lubricate their wearing surfaces automatically, too many of us are inclined to take their effective lubrication for granted.

Not that the necessity for lubrication isn't appreciated by most operators—but often it is felt that this involves only the addition of "some oil," now and then.

This is a mistake; and in the Textile industry especially, where the electric motor is exposed to dust, dirt and cotton refuse, is a serious mistake.

And, conditions being what they are, it is absolutely necessary (in securing efficient and economical operation) that attention be given to the construction of the bearings involved, the types of lubricants best suited, and the extent to which parts should be cleaned and fresh oils and greases applied.

Abuse or neglect will be certain to result in abnormal power consumption and high production costs, and one of the surest ways to avoid trouble is to use lubricants which are best suited for the conditions prevailing.

These lubricants, The Texas Company is in position to offer you: TEXACO oils and greases which have been carefully prepared and tested—and proven to be uniformly dependable.

In fact, TEXACO lubricants for electric motors are used in many of the most efficiently operated textile mills in the country today—and throughout the world.

We shall be glad, at all times, to answer any question relating to the use and most economical application of electric motor lubricants (or any other lubricants); and we would thank you to address inquiries to the address below.

Our exceptional delivery facilities assure the prompt handling of any order, no matter how small or how large, anywhere and everywhere.

TEXACO
TEXTILE
LUBRICANTS

THE TEXAS COMPANY
Texaco Petroleum Products
Dept. C4, 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

GORDON A. JOHNSTONE, for several years agent of the Winnsboro Mills, Winnsboro, S. C., has resigned to become agent of the Manville-Jenckes Company, Gastonia, N. C. Prior to going to Winnsboro, Mr. Johnstone was agent of the Fulton Bag & Cotton Mills, Atlanta, Ga. He is an ex-president of the Southern Textile Association.

J. W. CORLEY has become manager of the California Cotton Mills Company's plants in Selma and Uniontown, Ala., filling the position of E. E. Hendrix, who resigned to become treasurer of the Clarke Cotton Mills at Athens, Ga.

F. C. BERTRAND, overseer of spinning, Sunset Textile Mill, of California Cotton Mills Company, Selma, Ala., died recently. The association of operating executives of the company, of which W. R. Cook, superintendent, is chairman, passed resolutions of regret and sympathy to the bereaved family.

W. T. JOYCE, general manager of the plants of the United States Finishing Company, recently resigned to become affiliated wtih S. Slater & Sons, Inc.

LEONARD S. LITTLE, agent of the Lyman Division of Pacific Mills, Lyman, S. C., has become associated with Joseph Bancroft & Sons Co., Wilmington, Del., as works manager in charge of production. Mr. Little has been connected with Pacific Mills for many years, assuming charge of the development at Lyman when it was started several years ago.

DONALD S. ASHBROOK, PH.D., who has been associated with the Bancroft company, will now devote his entire time to research work, following the decision of the company to separate the production and research activities.

JULIAN K. MORRISON, vice-president in charge of merchandising of the Consolidated Textile Corporation, has been elected president of Brighton Mills, succeeding H. J. Haigh, who has resigned as president and treasurer. Leonard Goodwin, treasurer of the J. Spencer Turner Co., was elected treasurer of Brighton Mills. William L. Lyall was re-elected chairman of the board of directors.

C. S. LINK has been elected secretary and assistant treasurer of the Watts Mill, Laurens, S. C. He has been conected with the mill for about eight years.

L. C. KIMSEY, for a number of years connected with the Henderson and Harriett Cotton Mills, Henderson, N. C., has resigned to become general manager of the Peck Cotton Mills, Warrenton, N. C.

HERBERT BOOTH has become southern agent for the National Oil Products Company, Inc., Harrison, N. J., with headquarters at 204 Johnston Building, Charlotte, N. C.

F. L. THOMASON has been transferred to the Western North Carolina and Tennessee territory for the New York and New Jersey Lubricant Company, calling on the textile mills in that territory in connection with rendering service on "Non-Fluid" oils.

R. C. MOORE, of Charlotte, president of the Rhodehiss Manufacturing Company, is now also president of the Icemorlee Cotton Mills, at Monroe, N. C., succeeding A. J. Draper.

R. E. NAUMBURG, president of the Ren Manufacturing Company, Winchester, Mass., was recently elected chairman of the Textile Survey Committee of the American Society of Mechanical Engineers. H. W. V. Scott of Paterson, N. C., is secretary. Other members of the committee are J. A. Campbell, J. W. Cox, Jr., S. S. Paine, Prof. G. B. Haven, E. H. Marble, A. N. Sheldon, P. W. Bidwell, C. E. Davies, C. Rice, D. E. Douty and A. W. Thompson.

J. J. MONTAGUE has been appointed southern representative of the Litchfield Shuttle Company, with headquarters at Charlotte, N. C.

J. J. HYDER has become overseer of weaving at the Beaver Lois Mills, Douglasville, Ga. He was formerly at Columbus, Ga., and prior to that time was overseer of weaving at the Lanett Mill, West Point, Ga.

H. E. STEWART, formerly secretary and treasurer of the Belton Yarn Mills at Belton, Texas, has resigned to take a position as secretary and treasurer of The Loom Reed and Harness Company, Charlotte, N. C.

J. F. CHALMERS has become connected with the Glenn-Lowry plant of the Aragon-Baldwin Mills, Rock Hill S. C. He was formerly overseer of weaving at the Kershaw Cotton Mills, Kershaw, S. C.

T. E. STEVENSON has become overseer of carding at the New Canebrake Cotton Mills, Uniontown, Ala., succeeding W. T. Combs, resigned.

DAVID ROBINSON has become overseer of carding at the Pomona Mills, Greensboro, N. C.

J. ALFRED LECHLER is southern sales representative of The Glidden Company, Cleveland, Ohio. He maintains headquarters at 519 Johnston Building, Charlotte, N. C. He will represent the company particularly in the textile field, handling their line of paints, varnishes, etc. Mr. Lechler was formerly general manager of the Valley Mills, LaGrange, Ga.

JAMES A. GORHAM recently accepted the position of overseer of weaving at the Irene Mills, Gaffney, S. C.

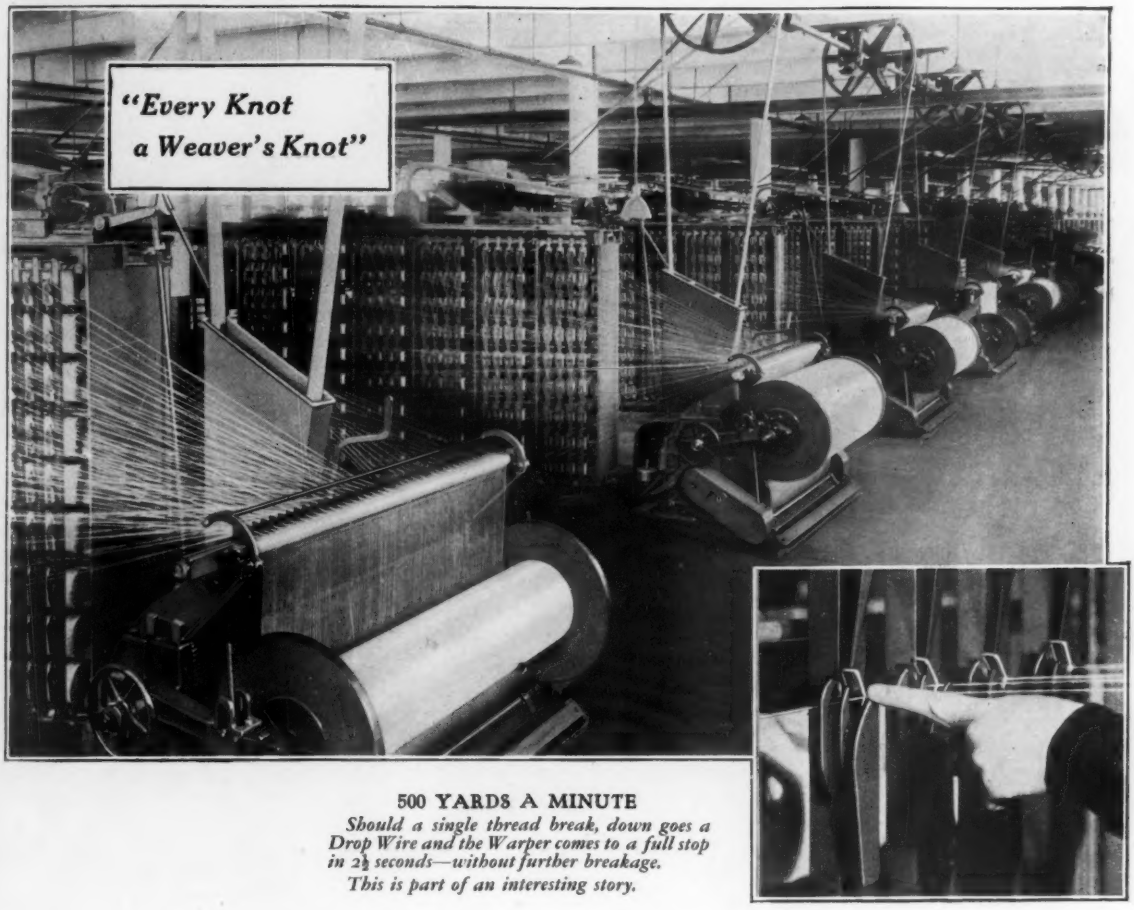
E. A. KISER has been promoted to superintendent at the Martel Mills, Asheville, N. C.

WALTER C. TAYLOR has become sales agent for G. Robinson and A. J. Pfeiffer, with headquarters at 209 Kinney Building, Charlotte, N. C. The former concern imports French viscose yarns, and A. J. Pfeiffer handles thrown silk and combination yarns. Mr. Taylor formerly was with the Charlotte office of the Duplan Silk Corporation.

A. O. HENRY has been promoted to the position of assistant superintendent at the Banning Cotton Mills, Banning, Ga.

L. C. LANGLIN has been promoted to overseer of carding in Mill No. 2, China Grove Cotton Mills, China Grove, N. C.

B. R. NANCE has become master mechanic at the Exposition Cotton Mills, Atlanta, Ga.



500 YARDS A MINUTE

Should a single thread break, down goes a Drop Wire and the Warper comes to a full stop in 2½ seconds—without further breakage.

This is part of an interesting story.

WHEN you increase production in your carding room or spinning room, you decrease the yarn cost per pound—but it is only when you increase production in your weave room that the output of your mill is increased.

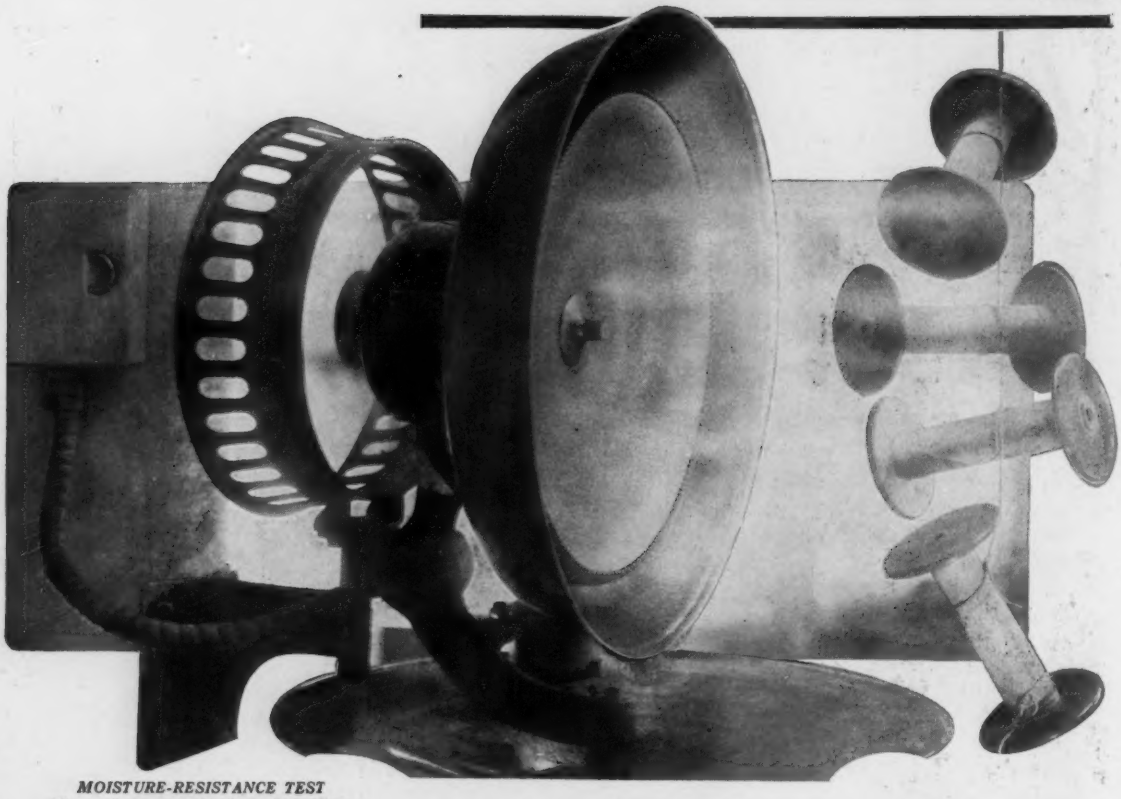
Use Barber-Colman Automatic Spoolers and High Speed Warpers.

BARBER-COLMAN COMPANY

GENERAL OFFICES AND PLANT

ROCKFORD, ILL., U. S. A.

FRAMINGHAM, MASS. GREENVILLE, S. C.



MOISTURE-RESISTANCE TEST

The spools were placed in front of a Bahnson Humidifier and drenched with moisture for several days. At the end of that time U S Vulcanized Fibre Head Spools alone had not warped. While we do not recommend this test because no spool would ever be subjected to this amount of moisture in ordinary use, nevertheless, it shows what U S Vulcanized Fibre Head Spools have stood when put to the test.

Another Mill Tests and Approves

U S VULCANIZED FIBRE HEAD SPOOLS

A LARGE MILL recently conducted a series of tests to see which spool best resists the hard knocks of everyday use. Various makes of spools were subjected to every conceivable abuse that a spool might encounter in the mill. At the completion of the tests we received an order for 15,000 U S Vulcanized Fibre Head Warper Spools, conclusive proof of the fact that these rugged spools stand up under mill conditions.

The superior moisture-resisting qualities of U S Vulcanized Fibre Head Spools are due to the special U S method of making the heads. The usual practice is to shave the surface of the fibre heads in a lathe to true the spool up. In making U S Vulcanized Fibre Head Spools, however, the heads are accurately die-cut from sheets of the best obtainable grade of vulcanized fibre, and perfectly centered by projecting tenons on both ends of the barrel. The original calendered surface of the fibre remains intact, a tough, glazed surface that resists moisture and abuse. Tests have proven that a half-ton pull won't budge these heads; therefore, it is certain that they will not loosen under ordinary conditions.

Consider the advantages of using spools with heads that will not come off, crack, or sliver, and are guaranteed to give long service and satisfaction.

You want spools like these.
Why not order yours to-day?
Write, Phone, or Wire.

Branch Offices:

Greenville, S. C.
High Point, N. C.
Philadelphia, Pa.
Atlanta, Ga.

U S BOBBIN & SHUTTLE CO.

PROVIDENCE, R. I.

BUILDERS OF BETTER BOBBINS, SPOOLS, AND SHUTTLES

AN OLD TIMER SAYS

In working with zest and giving his best,
Just for the pleasure of the giving,
In the hope of helping his brothers along,
"Old-Timer" finds the sunshine of living

"I'm going to sue him! I'm going to sue him!"

"Going to sue who, Jim?"

"You know that rascal I bought that house from took the mantle-piece out of the front room the next day without saying a word to me about it."

"Well, you see Jim, you should know at least a few of the simple things about law and what goes with property when you purchase it. You have been in the mill so long Jim, and have never owned any property, therefore I expect you have got many little surprises coming to you."

"Surprises, H—! I know when I buy something, and I am going to sue him."

"Just hold your horses, old man, and let's talk it over before you put out some of your good dollars for nothing.

"Tell me this: when the real estate man took the mantle piece out could you see where it had been fastened to the wall?"

"That's just it, Old Timer. He told me that he had just had that mantle-piece sitting there on two little wooden blocks just to make the house look nice and that it wasn't fastened to the house at all—the skunk."

"Then he had a perfect right to take it out, Jim. The next house you buy you be sure to examine things more closely."

"You bet your life I will "Old Timer." And you know just as I got there he was taking down all those shelves he had put up in the kitchen, but I told him I would knock his block off if he touched another one of them."

"You were right there, Jim; even if you rent the house to a man and he puts up more shelves, he cannot take them down when he leaves without your permission."

"And you know that head carpenter of his—well, confound my hide if he didn't haul off the wood they had stacked up in the back yard where they cut down trees to clear a place to build the house."

"He was right there again, Jim, but you see that tree there next to the garage that they have started to cut down, but did not finish the job? Well, that tree is yours, Jim, because it is still standing."

"Here comes that hyena of a head-carpenter now—"

"Good morning, gentlemen!"

"What in the devil do you want here this time?" asked Jim.

"Oh, nothing much. I kept my horse here about four weeks while I was building this house for the real estate company and I thought I would take that manure to put on my garden."

"Well, you have taken about everything else, I suppose you can take that too."

"No he can't, Jim! Manure is considered the same as real estate, and no man can move manure even if he has been renting your place."

"Get out of here, you—*?!x?x*."

"Come on, Jim, let the man go, and show me over your property. You know this is the first time I have been out here."

"Well, Old Timer, I am going to plant a row of willow trees right along here on the line—"

"No, Jim, you can't do that."

"What! Cant' plant trees on my own property? Now I do believe you have gone nutty sure enough."

"Don't you see that fine garden there, Jim?"

"Sure I do. What of it?"

"Well, if you plant willow trees right on the line, the roots are going to grow over into that garden and ruin it, then your good neighbor can have you up in court."

"Well confound! First thing you know you will have me afraid to spit on my own ground without asking a lawyer."

"Oh well, if you really want to be ugly to your neighbor you can build a high fence along the line if you want to, just so you stay on your own side, and you can build it out of old, ugly slabs if you want to, and you being on the east side it will shade his garden and ruin it; he cannot do anything about it in court either."

"Never mind, Old Timer, I am not quite that mean yet, and besides I want to be friendly with my neighbors."

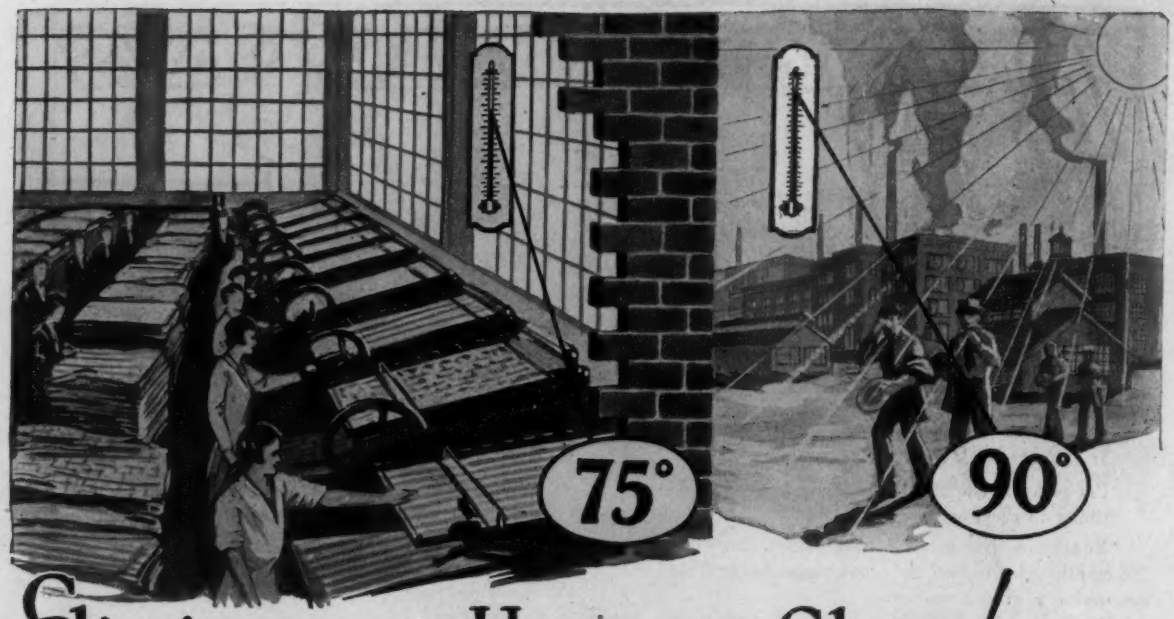
"If that is the case, Jim, you should not have built your garage quite so close to the line—you see you have only a small brick foundation, and when your neighbor goes to put in sewerage, if he digs a ditch for his pipe on that side close to the line, your foundation will give way and fall in the ditch—"

"Yes, and I will make him pay for it too."

"No, Jim, you will find out that you can't make him pay for it."

"Say, Old Timer, what will you give me for the property, anyway?"

"Don't get discouraged, Jim, I am only trying to give you a few pointers on what is personal property and what



Eliminate *the* Heat *and* Glare!

by Coating Your Windows with SKYCO No-Glare

ONE of the greatest contributing factors to employee inefficiency is the tiring heat and glare of the sun pouring in through unprotected glass. The glare means eye-strain and half-sick workers. The heat produces that dull, sagging fatigue that "plays hob" with a steady production schedule.

SKYCO No-Glare—a Positive Preventive

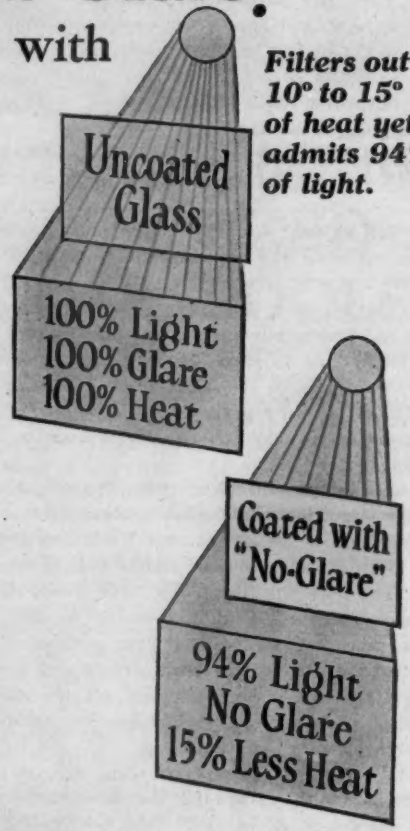
Some years ago chemical research perfected a true and economic cure for these evils—*SKYCO No-Glare.* No-Glare is a sky-blue liquid that is painted or sprayed on your windows or skylights. It filters the sunlight, absorbing the red rays that cause the heat and glare—and yet allows 94% of light to enter. You can even look at the sun through it.

Surprisingly Economical

No-Glare may be coated on windows either on inside or outside (rain won't wash it off) and one application lasts throughout the sun glare season. The cost (less than ½¢ per sq. ft.) is so small when compared to expensive shades and blinds that it is almost negligible.

Used by textile mills all over the country. Sold by mill supply houses. Price $2.50 to $3.50 per gallon, according to quantity.

THE SKYBRYTE COMPANY
1190 Hanna Building Cleveland, Ohio
Chicago Branch: 104 So. Michigan Ave.



Filters out 10° to 15° of heat yet admits 94% of light.

Gives a Cool Diffused Light **SKYCO NoGlare** *Saves Expenses of Shades*

is real property. Sometimes it is rather hard to distinguish the difference. For example, that tree that he did not finish cutting down is standing on your property, therefore, it is *real* property—but if you cut it down and work it up into furniture, it then becomes *personal* property.

"A pile of bricks is personal property, but when you put them together with mortar and build a house or wall or walk, they become a part of the land and are therefore real property."

"Say, Old Timer, talking about law, tell me this, you know that new plan of running my speeders I have been telling you about, well, by heck, it sure is working fine and the whole bottom fell out of my cost, and the boss, he says we mustn't let the other mills get onto it, and he said we should have it patented. The more I think about it the bigger it gets—Good Lord, man, it would make me rich—I could buy a dozen houses, and I'd swap that tin lizzie so darn quick—"

"Calm yourself, Jim, and take another chew; take a big chew, Jim, so you can't talk so much. Your boss should have known better than to say such a thing to you. You can't patent a principle, Jim; you can only patent a process or mode of applying a principle. Let me try to say it in plain United States.

"The discovery that an electric current would deflect a magnetic needle when put near it led Morse to use this principle and invent the telegraph, but in taking out claims for his patent, one of the claims stated:

" 'The use of an electric current for making intelligible signs at any distance.'

"The patent office held this claim void because it was a claim for a patent on a single principle.

"But when Bell came along and applied for a process of applying a principle, the patent office granted it to him.

"Machines and their improvements constitute the majority of patents. An improvement may consist in adding to or taking from a machine or substituting something different for one or more of the parts of a machine.

"Now whether a given improvement is patentable or not will depend on several considerations. It must not merely be an improvement in mechanical skill of construction, but it must be a substantial discovery which will add to knowledge.

"On the other hand, sometimes a patent is granted for something which to the average person would seem a trifle. For example, the first incandescent lights used so much current they were not practical. This was because no one could make the filament less than 1/32-inch in diameter.

"Edison came along and found a way to make a filament 1/64-inch in diameter, which cut the amount of current used in half, or more, and they granted him a patent on it. It is not, however, an invention to enlarge or strengthen a machine so it will operate on larger materials than it did before.

"It is not an invention to duplicate parts of a machine unless by re-arranging the parts you find a new mode of operating the parts.

"If you have a device which you think is patentable, but have not quite got it perfected like you want, put the date on the device with chalk and have a photograph made of the device in working position. This will protect you in case someone should try to beat you to the patent office. You can also make application to the patent office before you have your device finished; then you will be protected and also be given time to finish your experiments.

"Such steps are only necessary of course where you believe some one may try to take your idea and have it patented before you do."

"Much obliged, Old Timer. Guess I will have to be getting back home now."

"Well, Jim, let me give you one more little piece of advice."

"Go ahead! Shoot!"

"Don't ever go into any kind of contract or purchase of real estate without consulting a good lawyer."

"All right, Old Timer. So long!"

"So long, Jim!"

Face the Sun.

Don't hunt for trouble, but look for success;
You'll find what you look for—don't look for distress.
If you see but your shadow, remember I pray
That the sun is still shining, but you're in the the way.

Don't grumble, don't bluster, don't dream and don't shirk;
Don't think of your worries, but think of your work.
The worries will vanish, the work will be done,
No man sees his shadow who faces the sun.

The "Velvet Surface" Cone.

Sonoco Products Company, manufacturers of cones, tubes and cloth winding cores, and with main office and factory at Hartsville, S. C., have recently placed on the market what is known as a Velvet Surface cone, which is claimed to be an important aid in the winding of artificial silk yarns of all kinds and for fine numbers of mercerized, gassed and singed cotton yarns. The manufacturers point out that on the Velvet Surface cone the yarn lies in perfect position in the primary winding and assures a better delivery of the yarn with a minimum of waste, a feature that will at once appeal to knitters.

A Textile Reference Book.

The ninth issue of "The Textile Manufacturer Year Book," an English reference book on textile manufacturing, has been published. In addition to the usual informative departments this year's edition includes new features such as a discussion of long draft spinning, cotton waste spinning, etc. Two new tables show the breaking strength of various qualities of carded and combed yarns. Another section briefly reviews new machines introduced during the past year. The book is published by Emmott & Co., Ltd., 65 King St., Manchester, England. The price is three shillings, six pence net per copy. It is a valuable reference of English practice and methods.

New Branch Office at Birmingham, Ala.

Announcement has been made by the Link-Belt Company, of Chicago, Philadelphia and Indianapolis, that this Company opened a new branch sales office at 229 Brown-Marx Bldg., Birmingham, Ala., on March 6th. W. H. Norton, for many years connected with the Company's Chicago sales department, will assume the managership of the new territory.

ANALYZE—and KNOW

Modern Management controls thru *Analysis*. It is a high powered spot light piercing the grey limbo of questionable things or flooding the blackness of the unknown. It's a business microscope—bringing into human vision the hidden and obscure.

The executive presses a button. "Aladdin," his modern accounting department, places before him facts and figures, arranged, co-ordinated.

Is it Trade Conditions? Markets? Materials? Processes? Costs? Organization?—The story is revealed. Thru Analysis profits are guarded; balance and stability maintained; efficiency and service improved.

Long ago, Pascal called Analysis "the art of discovering unknown truths." Modern Accounting has made it *a necessary part of the Science of business*. The more competent the Analysis, the better the business.

ERNST & ERNST

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ALL KINDS OF
RUBBER COVERED ROLLS
Stowe & Woodward Company
Newton Upper Falls, Mass., U. S. A.

YOU WILL FIND

STRENGTH
EVEN EDGES
STRAIGHT WEAVING

Lambeth
SPINNING TAPES

Lambeth

Transmission Rope
Mule Rope
Spindle Bands
Frame Bands
Braided Banding
Twister Bands
Double Loop Bands

LAMBETH ROPE CORPORATION, NEW BEDFORD, MASS.

HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

A Weaving Problem.

EDITOR COTTON:

Can some of your readers help me out of a difficulty?

I have some patterns on the looms, running with four ends as one in a dent by themselves, coming from the bottom beam. My trouble is that this packed yarn does not take up as fast as the rest of the bottom beam, and they cause the drop wires to hang down, stopping the loom and causing the packed cords to weave under. I have tried putting the cords in a lease. This helps temporarily, but after weaving one or two cuts I have the same condition again. We have the old Whitin loom with the single index head. F. T. (CONN.)

Why Do the Mote Knives Break?

EDITOR COTTON:

I would like to hear from the readers of COTTON on this question—what causes the mote knives on cards to break? Our cards have about 75 per cent new lickers-in; the others ranging from one to twenty years old. Sometimes, when a card is started up after grinding and the lap is put through, while waiting for the web, our men hear a bang, and the knives are a pretty mess. Some go then but the most go at any time.

The knives are set to a 10/1000 gauge, which has always been giving satisfaction up to the last two months. Sometimes as many as eight a week break. The screens and wire are in good shape, even after the knives break. Also, the lickers-in are in good condition. Any information will be appreciated. T. N. (MASS.)

Rolling of Bobbins in the Loom Battery.

EDITOR COTTON:

The question from one of your contributors in South Carolina, with reference to bobbins rolling in the batteries on looms, which you published in the January issue, was interesting. And I have read in the subsequent issues several answers to this question, one of which came from me.

This is a matter that I would like to see discussed still further, as I think there would be something gained by doing so. I would like to get some pointers on it myself.

I notice that in several of the answers you published, some of the men intimated that in their opinion the trouble was not with the bobbins rolling in the battery, and I note that later you published a letter from the man who asked the question in which he called attention to the fact that I did not refer to this in my letter.

However, I will say that old bobbins will roll in a battery if not set just right, but this may not always be the trouble. With your permission, in continuation of this subject, I want to tell my own experience with filling breaking in the transfer of the bobbin.

I am running some E Model 48-inch looms. When I took them they were running a 6¾ bobbin in the battery. They were the only looms I had running a short bobbin, so I changed the battery over to take on an 8-inch bobbin. I also had to change the shuttle, using the same as we run in our Modified D Model loom. I also changed the lay tip on the battery end, making it longer. Then the filling would break when being transferred to the shuttle, most always dumping the first bobbin and running on the second. We started in to try and remedy this condition, and the first thing we did was to put a piece 1¾ inches long on the filling yarn holder, that is, the red casting on the battery. This gave more length of filling from the bobbin end to the filling knob that the filling is wound around. This helped a lot as the filling did not break when transferred nearly as much. I will say, however, that I have not entirely eliminated this trouble.

The shuttle mouthpiece has quite a lot to do with it, but outside of the Draper shuttle I would not know the make to recommend. I always try to run the bobbin in the shuttle with the small end of the bobbin a shade higher than the barrel end. This will relieve some of the strain on the yarn when being transferred. The shuttle springs should always be kept tight, if possible.

Another thing that will help out is to set the transfer fork so that it will not hit the small end of the bobbin until the transferer starts the barrel end of the bobbin.

I will say that I am running the same shuttle and bobbin in the Modified D Model loom, and not having a bit of trouble with filling breaking.

Now, as I have said before, I would like to have some other overseers, or anyone else, write in and give their opinion on this matter. No doubt a lot of us would be benefited by reading the articles. P. T. S. (MAINE).

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Dye Organizations Combine.

The business of the Dunker & Perkins Co., Boston, Mass., has been merged with that of A. Klipstein & Co. The offices have been removed to 263 Summer Street, Boston. Charles H. Dunker and his associates have joined the Boston staff of the Klipstein company.

THOMAS PERRY, superintendent of the North Carolina Finishing Company, at Yadkin, N. C., has resigned to accept a position with the Thomaston Bleachery, Thomaston, Georgia.

The name, Terrell, is more than the name of a manufacturer of textile machinery. It stands for continued operation at highest efficiency.

This is the reason many of the largest Terrell installations are in mills that first purchased a single Terrell machine.

The TERRELL MACHINE CO. Inc.
Mfrs. Jennaco Utsman Type K, Etc. Machines
CHARLOTTE, N.C.

General Supply Co. Danielson, Conn.
N.Y. and N.E. Representative.

BLANK ROLLER SHOP
BLANK MILL
Week Ending Oct. 13, 1923.

Type of Roll		Total No. Rolls	CLOTH Labor Cost per Roll	Cost per Yard	Rolls per Yard	Cost per Roll	LEATHER Cost per Dozen	Rolls per Doz.	Cost per Roll	Misc. Expense	Total Cost Per Roll
Short	C&W	4,062	.0226	3.00	220	.01362	36.00	682	.0527	.00382	.09274
Spinning	W	3,490	.0226	5.85	220	.02260	36.00	682	.0527	.00382	.10572
	B	1,476	.0226	.72	125	.00575	36.00	682	.0527	.00382	.08487
Long	C&W	788	.0226	3.00	110	.02725	36.00	341	.1056	.00382	.15927
Spinning	W	—	.0226	5.85	110	.05320	36.00	341	.1056	.00382	.18522
	B	—	0.226	.72	55	.01320	36.00	341	.1056	.00382	.14522
	C&W	—	.0226	3.00	48	.06250	65c skin	2.88	.2260	.00382	.31492
Drawing	W	26	.0226	4.93	48	.10300	65c skin	2.88	.2260	.00382	.35542
	B	50	.0226	.72	24	.03000	65c skin	2.88	.2260	.00382	.28242
	C&W	95	.0226	3.00	96	.03120	36.00	250	.1440	.00382	.20102
Slubber	W	—	.0226	5.85	96	.06090	36.00	250	.1440	.00382	.23132
	B	—	.0226	.72	45	.01600	36.00	250	.1440	.00382	.18642
	C&W	233½	.0226	3.00	128	.02340	36.00	416	.0865	.00382	.13630
Inter	W	—	.0226	5.85	128	.04570	36.00	416	.0865	.00382	.15862
	B	—	.0226	.72	60	.01200	36.00	416	.0865	.00382	.12492
	C&W	281	.0226	3.00	80	.03750	36.00	250	.1440	.00382	.20792
Fine	W	—	.0226	5.85	80	.07300	36.00	250	.1440	.00382	.24342
	B	—	.0226	.72	40	.01800	36.00	250	.1440	.00382	.18842

Note: The above statement is based on the price of the best grade of skins at $36.00 per dozen, but any grade and price of skins may be used. The grades of the cloth are shown in the second column, as follows: C&W (cotton and wool); W (all wool); and B (black cloth). The column "Misc. Expense" represents power, light and taxes, supplies, glue, etc., including a fair interest rate on the machinery used. Total Misc. Expense, $45.10.

A Cost System for Roller Shops.

EDITOR COTTON:

Some mills cover rolls and charge out the materials and labor without knowing just what it is costing them per roll for covering, and also without knowing if this cost is varying up or down. We know that the roller shop is a small department of the mill, still it is one of expense and one where a knowledge of true costs would be very valuable in keeping this expense down. With this idea in mind, the following cost system is outlined, which in itself is very simple and at the same time gives all the information a mill man would want.

After working up this system, a mill may find that it can have its rolls covered by a roller shop, if there is one in the vicinity, at a lower cost per roll than it is paying at the present time. Again, a mill may find, upon such analysis, that it can cover its rolls cheaper than it can send them to a roller shop for covering.

First, there is the question of labor cost per roll, and by referring to the form shown herewith, we find that the cost per roll for labor is the same for all rolls. Theoretically, this is not the case, but in practice there is very little difference between the cost of covering one roll and another of varying size. The cost is arrived at by taking the total pay roll for the week or month in question and dividing it by the total number of rolls finished in the shop during the period. This is the simplest way to arrive at the labor cost per unit of rolls covered.

Next, we turn to the question of what the cloth per roll costs. Here this is arrived at by taking a yard of the cloth to be used and seeing how many rolls can be made from one yard. This is divided into the cost per yard which gives the cost per roll, as shown in the form accompanying this article. The number of rolls per yard may be taken as a standard, and this standard remains constant. As the cost per yard changes, then the cost per roll changes, but is always divided by the standard number of rolls per yard.

The question of leather cost is handled in the same manner as the cloth. A dozen skins are taken and the number of the particular rolls that may be cut from the dozen skins is the standard number for the subsequent cost sheets for the roller shop. The standard remains constant and the price per roll for the leather changes as the cost per dozen of the skins changes. You will note that in the item of drawing rollers in the accompanying form, the price is based on one skin, as this is made of calf-skin and not sheep-skin.

Now we come to the question of Miscellaneous Expense. This item takes into consideration power, light, taxes, supplies—such as glue and other things besides cloth and leather—and also a fair interest rate on the investment in machinery used. This cost per roll is arrived at by taking the total miscellaneous expense and dividing it by the total production of the rolls for that period just as it was done in the labor cost per roll.

The last column in the form represents a summation of everything pertaining to the cost of the roll, and gives the total cost. You will note that there are three separate costs given in each type of roll. This represents three types of cloth that may be used in making this roll, and the result is a comparison of cost using each style of cloth. The note at the bottom of the form shows that "C & W" means that the roll for that line was made of cloth containing cotton and wool; the letter "W" stands for the same roll covered with all-wool cloth; and the letter "B" represents a cheap black cloth used for the same

roll.

One may figure out a cost sheet using different kinds of skins which have a different cost per dozen or a different number of rolls per dozen. Anyway, the mill that will follow out this system will be amply repaid for the effort.

CONTRIBUTOR No. 484.

Further Fly Frame Discussion.

EDITOR COTTON:

In the November issue of COTTON "G. C. R. (Mass.,)" "T. A. A. (S. C.,) and "C. C. (N. J.)", all defenders of the bobbin-lead fly frame, attempt to answer my article entitled "A Fly Frame Questionnaire," which appeared in the April, 1926, issue of COTTON.

"G. C. R." is unable to answer the first question, but says: "'Wash' has been dragging the compound pinion in ever since the original thirteen states declared their independence." I expected a different answer from a man who claims to understand the two systems.

"T. A. A." in answering the first question, gives us a lot of useless figuring. "C. C." seems to have misunderstood the question. "G. C. R." does not attempt to answer the second question. In answering the second question, "T. A. A." unconsciously gives the bobbin-lead frame a black eye—read it. "C. C." fails to answer the questions.

"G. C. R." answers question No. 3, and like "T. A. A." gives the bobbin-lead frame another black eye. "T. A. A." by his answer to question No. 3 proves that he is not qualified to discuss the subject. "C. C." in answering question No. 3 gives us one cause for unequal conditions, which I shall prove later in this article.

"G. C. R." has the right dope on question No. 4.

"T. A. A." in answering question No. 4 proves that he knows very little about the two systems of winding.

"C. C." by his answer to question No. 4 would have us increase unequal conditions on fly frames. "We want this extra pressure," he states. Then why was the Dunn flyer rejected by most manufacturers?

"G. C. R." is a practical man, and proves it by his answer to question No. 5. However, I am sorry that he takes my question as a trap. No, we are not expected to get a bobbin-lead frame out of the junk pile (where all bobbin-lead frames belong), but we all are forced to admit that when the train of gears driving the spindle, are worn, strain takes place, but not on the flyer-lead, for the reason that the cones take revolutions from the bobbins. Any retardation in this system causes slack. It should be clear to "G. C. R." and others, that any retardation of the flyer on any flyer-lead frame will not strain the strand because the bobbin is made to retard also, but with the bobbin-lead it does because the bobbin leads and of course any retardation of the spindle will strain the strand. I fail to see why these contributors are blind to the fact.

However, by his answer to question No. 5, "G. C. R." gives the bobbin-lead another knock.

"T. A. A." does not answer question No. 5. In fact, he does not seem to know the difference between the two systems.

"C. C." fails to answer question No. 5.

"G. C. R." answers question No. 6 perfectly.

"T. A. A." handles the question as if he were afraid of it.

"C. C." fails to answer question No. 6. He ends his article by stating: "I still don't just grasp what he means by his unequal conditions. Perhaps it is like an electric current; 'Wash' can feel it in his bones but is unable to define it." Oh! yes I can. But how can a man understand the unequal conditions on any fly frame when he does not understand a fly frame. His attempted answers to these questions proves that if conditions were equal, cones could be used with straight outlines. Think this over, "C. C."

"G. C. R." evades question No. 7. In this paragraph he states: "'Wash' might be interested to learn that a bobbin-lead frame can be converted to the flyer-lead type in a very short time, and the same cones used for either system."

When I was superintendent of a knitting mill in the state of Connecticut, I did change a bobbin-lead to a flyer-lead, but I found it was not so easy. The drive and the type of the sun gear, whether a spur gear, or barrel gear, plays an important part in making the change easy, not considering the type of flyer. However, owing to the difference in pressure, the same intermediate speeds are impossible.

In answering question No. 7, "T. A. A." deserves a lot of sympathy. How can ratios be considered in two separate speeds?

"G. C. R." fails to answer question No. 8. In answer to question No. 9, "G. C. R." leads us to believe that he has a secret about the flyer-lead frame. He admits that the flyer, when it rotates around the bobbin, is of some aid to the cone belt. But he tells us in this same paragraph that there is one big feature on the flyer-lead that very greatly aids the cone belt. So, "G. C. R." is now with me in defending the flyer-lead frame. I have no doubt that his secret is that the sun gear revolves in the same direction as that of the driving shaft. My grandfather knew that. Follow the bottom cone and its connections to the bobbin, and no other advantage will be found.

By his answer to question No. 9, "T. A. A." again proves that he is not qualified to discuss the subject. "G. C. R." fails to answer question No. 10. "T. A. A." in attempting to answer question No. 10, terminates his article like a drowning man going down for the third time. He admits that the pressure of the presser pad in the bobbin-lead makes a firmer bobbin, but he fails to see that it takes good stock to make a firm bobbin on any bobbin-lead frame.

As stated, I have been through it all when superintendent of a knitting mill, in changing to reverse twist and changing the wraps on the presser finger from 3 to 2. Strips can be run to better advantage on the flyer-lead because the pressure is not as great and there is only one tension. The greater the pressure, the more unequal are the conditions, simply because you reduce or condense the strand and change the relationship between the cones and flyers. Get that?

In answering question No. 11, "G. C. R." states that I am wrong to say that a lower grade stock can be run on a flyer-lead frame. He states: "'Wash' has in mind more presser pad thoughts. Another of his unequal conditions that doesn't exist." Well let us see. In question No. 6,

he admits that the pressure of the presser pad is great enough to revolve the spindles. Then the greater the pressure the firmer the roving is held on the surface of the bobbin. The speed of the spindle creates the pressure. Then on the bobbin-lead, when the frame is run at a low speed or when stopped, no pressure exists and the tension is from the drawing rolls to the surface of the bobbin. When the frame is run at the proper speed or at an excess speed the pressure is great, and the tension is then between the drawing rolls and the grip of the presser pad. That is why when a frame is running slack on full speed, the minute it is slowed down, the ends tighten up again. Again, when the tension is running tight on any bobbin-lead frame, when the frame is stopped the ends break on the back row of flyers. The reason why more ends break on the back row is because the distance from the drawing rolls to the surface of the bobbin is shorter. See the point? That is why you can run a lower grade of stock on a flyer-lead frame, and a very practical reason. Don't you think so?

"G. C. R." terminates his article by asking three questions:

(1) "What changes would be made in a bobbin-lead frame to run reverse twist? Tell us more than one way of accomplishing this result.

(2) "What changes would be necessary to convert a bobbin-lead frame into a flyer-lead?

(3) "If in running a frame it were necessary to change from the ordinary amount of twist, what changes would be necessary?"

As regards question (1), there are more ways than one, but after the change, will the bobbin still lead? Let "G. C. R." answer this before I answer. His question states: A bobbin lead with reverse twist.

(2) Paragraph 3 of my article entitled "Fly Frames and Their Faults" in the same November issue, answers question No. 2, the flyer not considered.

(3) Banding calls for the hardest twist. From a 1.50 intermediate roving I have the following hang-up on a Howard and Bullough jack frame. Hank 4, draft 54, twist 16, rack gear 20. I have used as low as a 10 twist gear. Of course the slot must be lengthened to allow more sweep for the carrier stud.

On the aforementioned twisted work, it takes four hours and fifty minutes to make a set. Weight of full set is 91 pounds. I give these figures to prove that I am not bluffing.

I will now answer my own questions as promised.

(1) This question was put for two reasons. First, I want to point out to the young student that a change in the compound pinion changes the position of the cone belt, the same as changing the bottom cone gear. For instance, on a Providence machine, the cone gear is very large, and the compound gear very small, so it is cheaper to have a compound pinion made than it is cone gear.

(2) This is due to unequal conditions, which I am going to prove. Examine a flyer presser closely, and it will be found that a slight amount of resistance exists, due to the faulty method of attaching it to the hollow leg, or a roughness at the upper part of the presser rod that fits in its receptacle on the hollow leg.

Every practical man will admit that it is impossible to have every flyer perfect. Some of course are perfect, and readily respond to the speed of the spindle. However, those that are slightly defective and unable to respond to the speed of the spindle, allow the diameter of the bobbin to increase slightly, which in turn stretches the roving more, and at the finish of the set, there is the same weight, or nearly the weight, but a longer length.

"G. C. R." has answered No. 3 to my satisfaction. Now please let us not hear any more about the high speed of the flyer-lead bobbin when the set is nearly completed. At no time during winding does the bobbin equal the speed of the spindle in the flyer lead system.

Question No. 4, is answered by "G. C. R." I could not do any better. But I am now wondering why he is a defender of the bobbin-lead system.

"G. C. R." answers question No. 5, o. k., and I have already explained the reason.

Question No. 6 is answered in the proper way by "G. C. R." But a little more should be added, for did I not state that it is that which brands the bobbin-lead as the more imperfect machine.

"Well, "G. C. R." admits that there is enough pressure at the presser point to revolve the spindles. The cone belt is the only agent to do the winding, which is known as the excess speed. Then we must admit that it is a great strain on the cone belt to draw the roving past this point of the presser. This it is that brands the bobbin lead system wrong and creates also unequal conditions.

Question No. 7 was not answered, so the answer follows:

If these defenders of the bobbin-lead frame understood the two systems, they would have answered as follows: They all admit that on the bobbin-lead, the point of pressure is much greater than on the flyer-lead. Now, they admit also that the pressure condenses the strand more, makes a firmer bobbin, and this of course reduces the diameter of the bobbin. Then why close their eyes to the fact that these several groups of layers, which are laid under different pressures, changes the outline of the cones for each group, which I shall prove later?

The foregoing paragraph answers question No. 8.

"G. C. R. admits in his answer to question No. 9, that when the flyer rotates around the bobbin during winding, it is of some aid to the cone belt. It can be seen by the tone of his paragraph that he hates to admit it. However, I want to repeat here, that "G. C. R." is a practical man, and I have high regard for his views, even if we do differ.

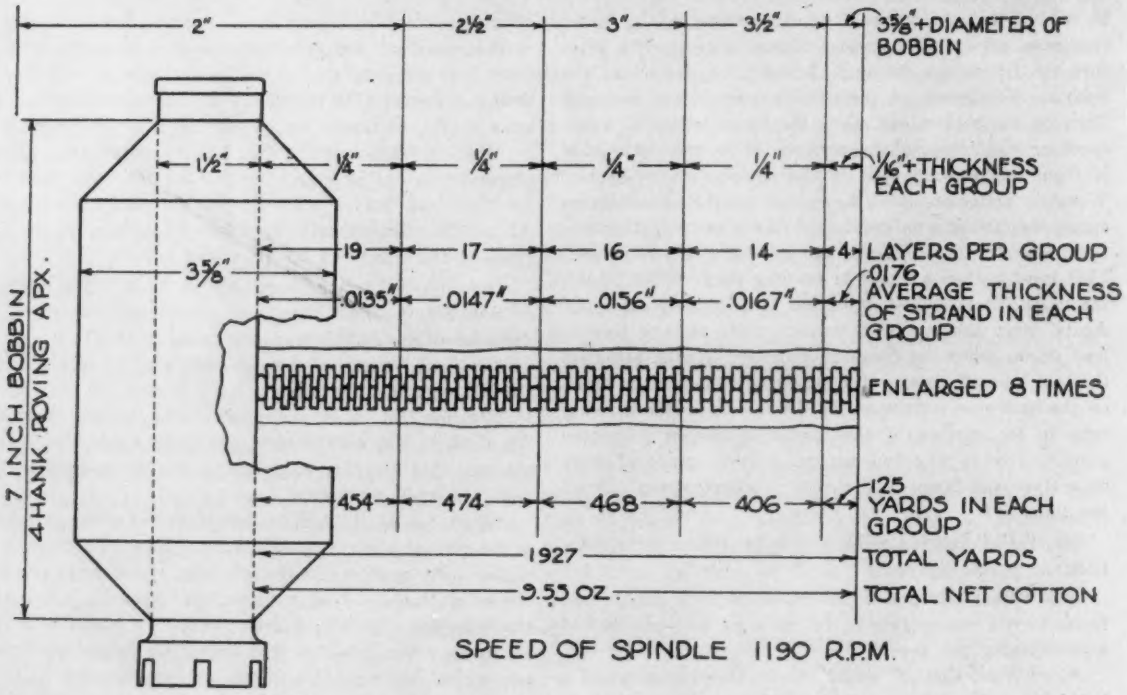
Did you notice how these defenders of the bobbin-lead evaded question No 10? There is a reason. You know it takes a strong belt to draw the roving past the point of pressure, especially if the frame contains say, 192 spindles. While on the other hand, in the case of the flyer-lead, the flyer rotating ahead of the bobbin and taking it with it, can be run with any old belting.

I have answered question No. 11.

"G. C. R." states in the 11th paragraph of his article: "To say that a lower grade stock can be run on a flyer-lead is wrong. 'Wash' has in mind more presser pad thoughts—another of his unequal conditions, that does not exist."

The sketch is the proof of all my claims regarding unequal conditions on fly frames.

This diagram shows the analysis of a bobbin of approximately 4.00-hank work, with the layers from the wooden bobbin to the outside diameter of the cotton, en-



larged eight times. (Reduced in our cut but in proportion. —Editor.)

The company divided this distance, which is approximately 1 1/16-inches, into four groups, and they have given, as it will be noticed, the layers per group with the average thickness of the layers in each group. These figures will be read in thousands, that is, .0156, should be read as fifteen and six-tenths thousandths (15 6/10ths thousandths).

The diagram was obtained from the Woonsocket Machine & Press Company, Incorporated, to whom I am greatly indebted.

I obtained the diagram from this company for two reasons. First, because shortly after they took over the City Machine Company's roving frame several years ago, it was discovered that the cones on this frame were not what they should be, hence, the outlines were changed, and since then, no trouble has ever been experienced with their cone outlines and tension. Second, because it is admitted by most practical mill men that the tension on the Woonsocket frame is as near perfect as can be obtained.

Every textile school student should prize this diagram, for it not only proves my preachments for over 13 years, but is proves the functions of a perfect flyer, and by it, it should be easily seen what a defective flyer will cause.

In closing, I want to call the attention of "G. C. R." to what he states in the 6th paragraph— "As to question No. 6, if spindles were plumb, and well oiled, there is no question in my mind but what the pressers should be able to revolve the spindles."

This fact was proven by the Saco-Lowell shops.

"T. A. A." states in the same paragraph: "I have never seen a bobbin-lead frame with so much pressure on the presser pads as to revolve the spindles, and if 'Wash' runs his frames this tight, I don't doubt his having stretched roving."

I hope these two gentlemen will argue this point between themselves. I have proven my case.

WASH (R. I.)

Covering Scavenger Rolls.

EDITOR COTTON:

Is there such a thing as a good cold paste to use in covering scavenger rolls? In using hot glue it frequently becomes cold before we get the rolls covered, causing one end to come loose, and it has occurred to me that if there was a good cold paste or glue for this purpose that perhaps it would hold better. CONTRIBUTOR No. 523.

Piecing Up Ends After Doffing.

EDITOR COTTON:

In the January number of COTTON I noticed that "J. H. (S. C.)" would like to have some information on how to piece up ends after doffing, where he has bunch builders on spinning frames and feelers on looms.

Sometime ago I experienced some of this same trouble, and hope that I can be of help to this contributor. As he does not approve of piecing up with pieces, the next best thing I know of is the system we use in our mill and it gave perfect satisfaction, and requires but little time in teaching the doffer. In a couple of days he can piece up just as fast this way as he can most any other way.

This system is to have the doffer thread up the traveler before the starts the yarn around the quill. By doing this the yarn will wind around the quill in a ring. Then stop the quill and lift it above the ring rail with one hand and slip the ring of yarn to the bottom of the quill with the other, and this will answer for a bunch. This system is very easily put into practice and will give perfect satisfaction if carried out. J. C. (N. C.)

A Question on Mule Spinning.

EDITOR COTTON:

I should be glad if any of your readers can give me some information on mule spinning.

Is there any gain in production by the 3-inch roller motion while winding, *provided* the spindle speed and twist per inch remain *exactly* the same? If so please give a definite and complete answer. CONTRIBUTOR No. 548.

Why the Pressure Varies at the Presser Pad.

EDITOR COTTON:

In the December issue of COTTON, "Contributor No. 231" asks, "How is it possible to get a variable pressure on the presser pad, when the speed of the presser is constant?"

It is not possible to get a variable pressure if the speed is constant (all other things being the same), but the speed is not constant, it is the revolutions per minute that are constant, the *linear* speed of the presser varies at every traverse of the rail, and that is not the only variable, either.

By inspecting a flyer it can be seen that there is an iron rod hinged loosely to one leg of the flyer and that the presser is joined to the lower hinge. The presser pressure is produced by the centrifugal force of the iron rod; that is, by the tendency of the iron rod to fly away from the center of the circle through which it is being revolved.

The dusty physics book tells us that

$$F = \frac{mv^2}{r}$$

where F is the centrifugal force of a (weight) mass m traveling at a linear velocity v through a circle of radius r.

For simplicity, the sketches in the accompanying drawings are exaggerated, and the empty bobbin diameter is assumed to be infinitely small.

In Fig. 1 we illustrate the fact that the pressure is greatest when starting with the empty bobbin. The iron

FIG. 1

FIG. 2

rod is at the greatest distance from the center, and its centrifugal force is maximum; hence, maximum pressure.

As the bobbin fills, as is shown in Fig. 2, the presser is forced outward, bringing the iron rod closer to the center. This produces two effects, both of which tend to lessen the pressure exerted upon the bobbin by the presser pad:

(1) The iron rod being closer to the center, its radius is decreased, and, making the same number of revolutions per minute—through a shorter path—its linear velocity is decreased. Since the centrifugal force varies directly as the velocity squared, a small decrease in the radius produces a large decrease in the velocity squared, and a corresponding decrease in the centrifugal force. The pressure at the presser pad is reduced.

(2) When the bobbin is empty, the centrifugal force of the presser itself is practically zero, and is negligible, but as the package grows and the radius and linear velocity of the presser increase, a force is developed, by the presser, which acts away from the bobbin and in opposition to the force produced by the iron rod, so the pressure exerted by the presser pad is reduced.

These are the major causes which contribute to produce a variable pressure at the presser pad.

V. Y. (MASS.)

Separating Day and Night Production.

EDITOR COTTON:

In answer to "Contributor No. 998," will say we use pick counters and run day and night. On our white work we use a stamp *"D"* for day and *"N"* for night, stamping the cloth night and morning. For instance *N* to *N* is night production and *D* to *D* is day production. By reversing the stamp we have each weaver separated.

In our colored goods department we are allowed no markings at all on the goods, so we have devised a new system there. We use a small wisp of waste placed in the selvage. Hard sized waste is better for this purpose, and it should stick out from the selvage an inch or more, blue being for night and red for the day. If a defective portion shows up it will be seen instantly which weaver is to blame. We have been using the waste system for three years and find it suited for our work the best of any system. We let the smash hands place the waste on their tour at change time. A. V. (N. C.)

A Crack at "Old Timer" and a Question.

EDITOR COTTON:

What is the matter with "Old Timer?" Is he slipping? Did the remark about his beard, mentioned on page 349 of the February number of COTTON, get his goat so that he forgot himself when he told Jim that formula for production on the spinning frame "100 r.p.m. × diameter of the front roll × 600 minutes per day × 224 spindles, divided by 36 inches (1 yard) × 840 × 30s yarn = pounds of 30s yarn in 10 hours at 100 per cent?"

Here is what I'm getting at. Wouldn't it look better this way? 100 r.p.m. × *circumference* of front roll × 600 minutes per day × 224 spindles, divided by 36 inches (1 yard) × 840 × 30s yarn?

Don't let "Old Timer" be offended. It may have been a printer's error; if so, that lets him out. Anyhow, I'd like to hear what he has to say about it, and probably he will be telling Jim to watch his step because there are always some fellows ready to jump on him when he makes a little slip.

Of course, we all know that "Old Timer" meant to say *circumference* instead of *diameter*, and if it does happen to be a printer's error he can take it out of the printer. Nevertheless, it shows that his articles are read very closely, and they sure are very interesting. So let him come on and vindicate himself. N. B. (MASS.)

EDITOR COTTON:

Referring to "An Old Timer Says," page 351 of the

Tolhursts in Standard Silk Dyeing Co. plant in Paterson, N. J.

The secret of Tolhurst leadership in volume of work turned out, savings in operation and maintenance, and in general all 'round satisfaction is found in the fact that:

a: *Specialists* designed the Tolhurst
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c: *Specialists* service the Tolhurst

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1852 DESIGNED AND BUILT BY SPECIALISTS 1927

February number of COTTON, he is quoted as saying:

"For example, a spinning frame is making: 100 r.p.m. × the diameter of the front roll × 600 minutes per day × 224 spindles, divided by 36 inches (1 yard) × 840 × 30s yarn = pounds of 30s yarn spun in 10 hours at 100 per cent."

If we assume the roll diameter to be one inch, we get a production of 14.85 pounds per day of 10 hours per frame.

Saco-Lowell tables give a production of .242 pounds per spindle per day of 10 hours, with a 1-inch diameter roll at 117 r.p.m. Substituting this 117 r.p.m. for the 100 in "Old Timer's" formula, we get 17.35 pounds per day, per 224 spindles; or, .0775 pounds per spindle per 10 hours.

If we multiply the roll diameter × 3.1416 × 600 minutes × 117 r.p.m. × 224, and use the same divisor as before, we check with the Saco-Lowell tables. Did "Old Timer" omit his pi?

How Much Value is Added in Preparing Cotton?

So much for the criticism. May we ask for some information? Can you tell me, or advise me where we can find the percentage value added to the price of cotton for its successive stages? For example, with cotton at 14 cents per pound; it is opened, carded, drawn, spun, woven, etc. What has the 14 cents become when the cotton has been opened? Is it worth 15, 16, 18 or more cents per pound, and so on through the successive operations?

O. O. (PA.)

Why the Roving Laps on the Middle Steel Roll.

EDITOR COTTON:

In the January issue of COTTON "Contributor No. 1024" inquires relative to the cause of roving lapping around the middle steel rolls in his spinning room, his trouble seeming to be more in the fall of the year than in the spring and summer.

This contributor states that he is running a 1-inch middling cotton, but he does not give his roll settings in spinning, although he gives his drafts and twists. The closer he can set his rolls, front to middle, the less trouble he is likely to have, for it seems to me that there is a breakage of the fibers at this point. I have, however, seen roving that has lapped on middle steel rolls even when set well under the staple, and I believe that all spinners experience the same trouble with the proposition, more or less.

I have often thought that humidity and temperature had quite a hand in this, which would seem to be the case, as "Contributor No. 1024" states he has more trouble in the fall than in the spring and summer. As he has altered no other conditions, his stock and mixings being the same, the humidity and temperature must affect the lapping.

I would suggest that this contributor, if possible, make a sample batch in the mixing room, *with no waste*, and put this as a test against his regular run and note if there is any difference in the number of laps. I should set the rolls closer if possible, and note the results on the regular work. I should also advise, if possible, that he try a little less twist in the roving to get a closer setting in the spinning and try to regulate the humidity to the temperature, as a relative humidity may mean a different "actual" humidity at various temperatures, and note the conditions in the room at times when the laps seemed to grow less or more. I would also suggest that he keep the frames well

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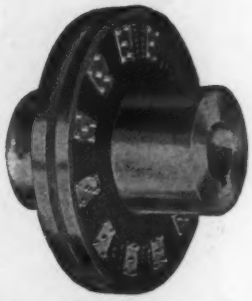

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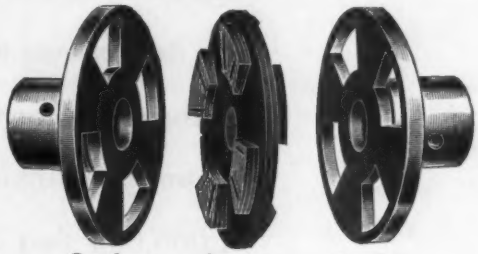

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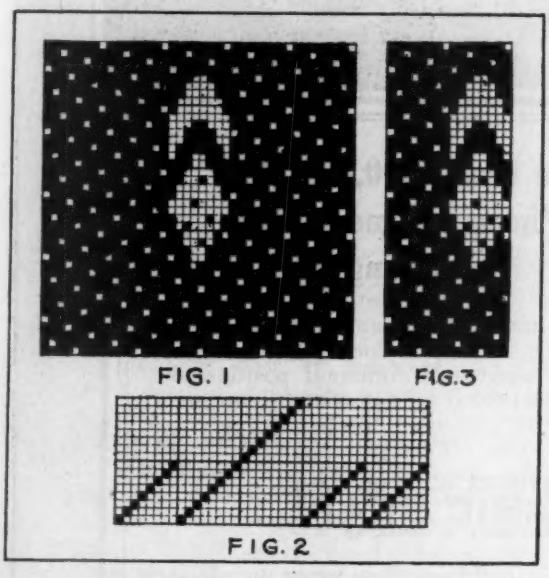
scoured and note the condition of the steel rolls; check the break draft on the frame and see if an alteration here will aid—try one frame.

These are only *suggestions,* that "Contributor No. 1024" may or may not be able to try out. I should like to hear what results he obtains, and I also wish that "D. L. E. (Ala.)" and "J. H. H. (Conn.)" would reply to the questions as they did to my inquiry sometime ago on thread laps. BERT (R. I.)

Answers Question on Designing.

EDITOR COTTON:

In reply to the designing question of "Contributor No. 1041." He does not state the satin weave used, but I presume it to be the 8-harness satin. An 8-harness satin weave, warp face, will naturally be an 8-harness satin weave, filling float, on the back. Where a spot figure is introduced it becomes necessary to place the ends weaving the figure upon separate harnesses to those weaving an unbroken satin stripe. Thus, while the satin may be of any required width, the figuring ends are limited to the number of harnesses available, unless the figure is drawn in straight order over more than one repeat, which will cause the figure to acquire a block shape. The figure will be filling float on the face, satin weave, and warp float on the back, while the remainder of the stripe will be warp float on the face, satin weave, and filling float on the back.



The weave design on point paper for a satin stripe with a spot figure is shown at Fig. 1, with its drawing-in draft at Fig. 2 and the chain draft at Fig. 3. This requires 16 harnesses to weave, and leaves 4 extra harnesses for the plain weave of the ground and selvages, on a 20 harness dobby. The best results are obtained by running the satin weave of the figure in the opposite direction from that of the ground.

A point draft, while it doubles the width of the repeat of the figure, is hardly suitable for satin weaves as it causes the direction of the satin to reverse and thus breaks the evenness of the weave. CONTRIBUTOR NO. 104.

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Why Rolls Sometimes Give Trouble.

EDITOR COTTON:

"Contributor 6203" writes in the November issue of COTTON of the trouble he is experiencing with uneven work. I note he states that he is using solid front top rolls on all of his fly frames. This may be one cause for uneven work if the weight hooks have become worn and also if the roller necks have become worn. I wonder if this contributor has ever noticed that in putting newly covered rolls in his fly frames there was any trouble in getting the same rolls to run smoothly, and if he realizes the cause of this.

This is caused by some rollers wearing smaller than others and at the same time wearing grooves to fit themselves into the weight hook, and then when a roller which has not been run so much replaces this, his trouble will begin. I will try to illustrate what I mean by a sketch so that

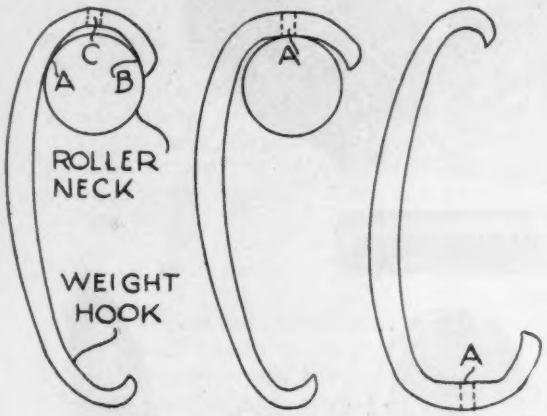


FIG. 1 FIG. 2 FIG. 3

"Contributor No. 6203" will understand it. I will simply draw a side view of the roller and weight hook.

In Fig. 1 I have shown a hook which has become worn with a roller neck which was also worn, and I have tried to show what happens when we renew this roll with another which is of a slightly larger diameter, because it has not worn quite so much. The effect is that the hook acts as a break on the roller at the point *A* and *B*, causing slippage of the roller and consequently uneven work.

If "Contributor No. 6203" has a spare set of hooks hanging around his store room I would advise him to have them filed so that there is a flat surface at the point *A* as in Fig. 3. Then when the roller is weighted the pressure is only at one point, *A*, as shown in Fig. 2.

I trust that this letter will be of some service to "Contributor No. 6203" and possibly to other readers of COTTON.

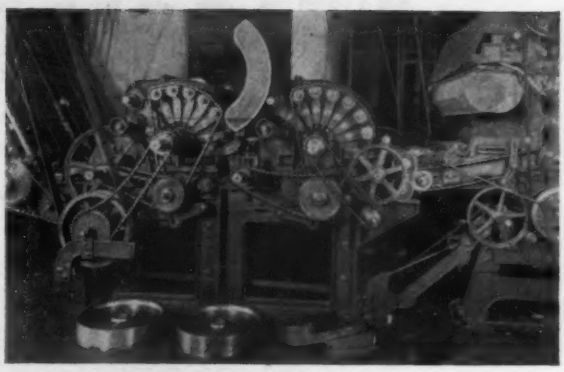
W. O. R. (CONN.)

Trying for Cleaner Yarn.

EDITOR COTTON:

Will you convey my thanks to "D. E. (R. I.)" for such a detailed reply as he made in the February number of COTTON in order to help me in the solution of the difficulties I am experiencing in the making of cleaner yarn.

I would state that all the points this writer mentions, concerning the cards, etc., which should be watched have been looked after exactly as he advises, so the fault could



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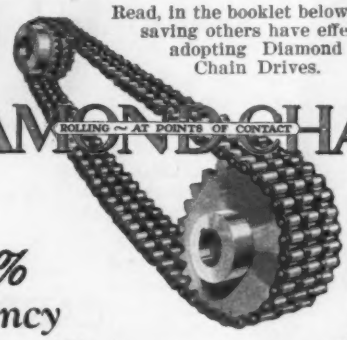

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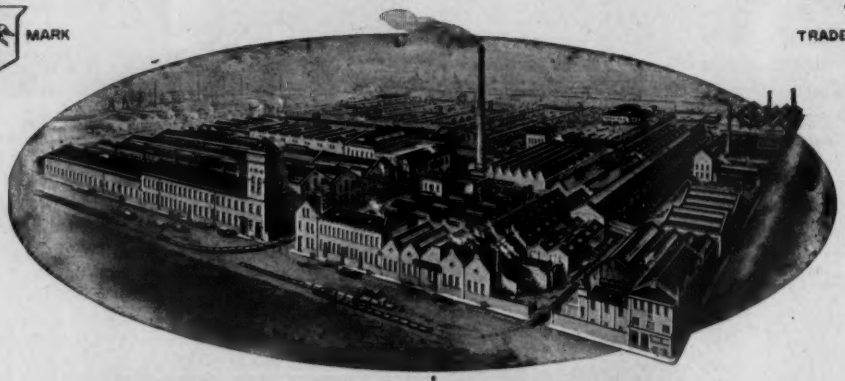

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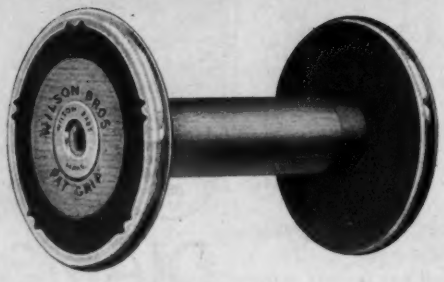

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not be there. He asks for our drawing layout, and will say that we have 6 ends up at each head of drawing and put it through 3 processes; the weight of the card sliver is 150 grains per 3 yards, first head of drawing 163 grains (3 yards); second head, 176 grains (3 yards). Finishing head, 190 grains (3 yards). All our top rollers are leather 1¼-inch in diameter. We strip the cards three times per day for an 8¾-hour shift, using the ordinary wire brush, as we have no vacuum process.

I am trying four laps up as suggested by "D. E. (R. I.)" and reducing the breaker lap to 16 ounces, so will report later, after a good trial, as to improvement, if any.

CONTRIBUTOR No. 1019.

Changing a Comber Waste Percentage.

EDITOR COTTON:

In reply to the letter by "W. O. R. (Conn.)" concerning changing the comber waste percentage, which was published in the October issue of COTTON, this contributor mentions detaching later to take out less waste, but let me also add:

Feeding earlier, nipping earlier, wider settings of nippers and top combs to the cylinders, and by decreasing the angle of the top comb. Below is a list of standard timings:

TIMINGS.	INDEX GEAR
Feed at	4½ to 6
Nipper knife to leave cushion plate at about	4½
Nipper knife to touch cushion plate at about	9
Leather detaching roll to touch segment at about	6¾
Leather detaching roll to leave segment at about	9½
Delivery roll to reverse at about	1½
Delivery roll to deliver at about	6
Top comb down at	5 to 6

If this information is not new to "W. O. R." it may be to some other workers interested in combers, but I trust that it may be of some help to this contributor.

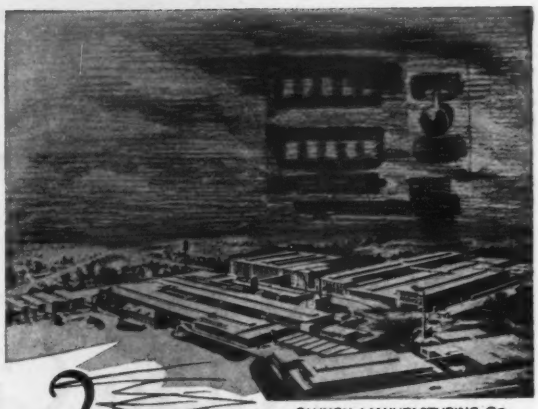
H. D. (MASS.)

EDITOR COTTON:

Having read in the October number of COTTON, the letter by "W. O. R. (Conn.))" in reference to changing the comber waste percentage, I should like to give my opinion on that question, hoping that I can help him to improve his knowledge on combers.

As this writer says, the builders advocate backing off at index No. 1 on the Nasmith and Nasmith-Whitin combers, and, in his opinion, this is correct.

Now naturally if the steel detaching roller is backed off later it detaches later, for it is controlled by the run or cut of the detaching cam. I wish to state right here that to change the waste percentage by changing the timing of the detaching motion is the wrong way to do it. A man changing by that method is combing medium or long cotton. Also a man who backs off the steel detaching roller earlier just to increase the waste percentage is causing the firm to lose thousands of dollars per year, simply because the detaching rollers are timed to return the previously combed fibers earlier and timed to return the last rows of needles, which pull the fibers from the bite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of the detaching rollers and carry them around into the waste, and those fibers are good cotton which is then sold for comber waste. Therefore the mill is losing the difference between the price of comber waste and the finished combed yarn minus the cost of the processes from the combers to the finished yarn.

It is essential at times to back off later when working medium and long cottons solely for the purpose of allowing the half lap to pass by before the fibers are returned by the detaching rollers, thus escaping or preventing the last rows of needles on the half lap catching the returned fibers. Then if the waste percentage is too low, increase it by changing the nipper plate to detaching roller setting, set it wider in this instance; or the top comb to detaching roller setting; or the time of the top comb entering the cotton. Whenever the detaching cam is timed to back off or detach later, the clutch must be watched pretty close to see that it is coming in and out of gear correctly and meshes true, for if you back off too late, then occasionally you will hear a "bang" from the clutch gear through catching on the nose of the teeth of the clutch shaft gear and slipping in with a "bang." That can be adjusted by the clutch cam and sector peg and sometimes by adjusting the clutch fork. Even when this is done, always keep an eye on the condition of the detaching cam. A comber man must thoroughly understand the mechanism of the comber headstock to change its timing and setting, for the reason that the detaching cam is cut one certain way so as to cause the quadrant arm, through the cam bowl, to function correctly, that is, to fall, raise and pause at a certain time and the clutch gear to operate perfectly. That is the reason why the builders of the combers advocate backing off the steel detaching roller precisely at index No. 1, for, as previously stated, the cut of the cam must be considered at all times in changing the timing any great amount.

For an illustration to the readers as to what I am referring, for instance, when the clutch gear on the Nasmith comber is coming back into gear at about index No. 38, the cut of the cam is so designed as to allow the quadrant arm to stop or pause in about the middle of the upward stroke, sufficiently to allow the clutch gear to come true into gear with the clutch shaft gear that the quadrant arm operates or controls, then if the cut of the cam is so designed that index No. 1 is the best place to back off to the benefit of all the mechanism, wear and tear of cam and clutch, it would be folly to change this timing any great amount if there is not a sufficient understanding of all the parts in the headstock to balance the change.

Any time I am working long cotton and the last two or three rows of needles on the half lap take the returned sliver from behind the steel detaching roller into the waste and I cannot stop it by backing off at about 1¼ index, then I resort to the best and easiest method without any detriment to any part of the comber or quality of the work, and I would recommend it to "W. O. R." or any other reader of COTTON. The method is as follows:

Set all the cylinders forward anywhere from one half inch to one inch with the index at No. 2½, according to the length of stock worked. Then set the nipper knives to close a little earlier, so the nipper knives are closed when the first row of needles are under the nippers. Also be careful in setting the nipper knives to the half laps. By using this method you will be able to back off the steel

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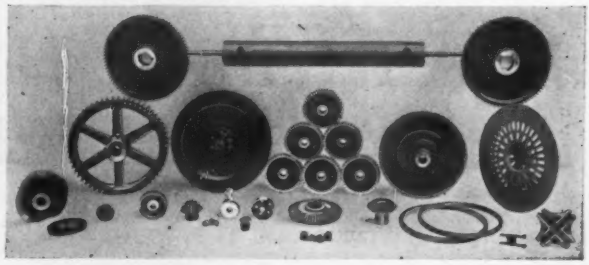

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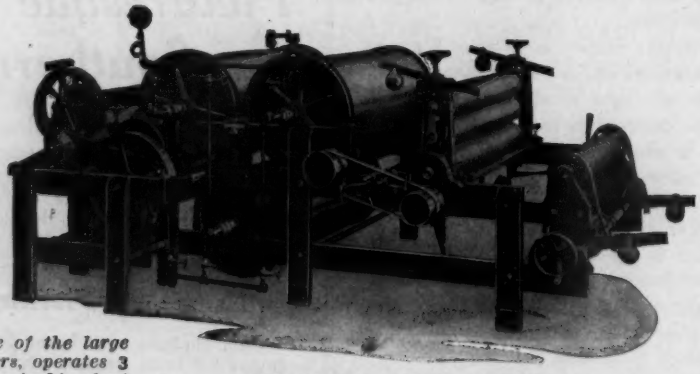
THE JOHNSON WARP-SIZING MACHINE



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Charlotte, North Carolina, U. S. A.

detaching roller at index No. 1 without the returned combed sliver getting caught by the last rows of needles on the half lap. It will be found to be a more correct method for long cottons in overcoming the mentioned evil of the half lap taking good cotton into the waste can. To prove it, Nasmith's new single-six comber cylinders are set at index 1½ with the 2½-inch gauge, just vice versa to what I am advocating, but it attains the very same object. I might also say that I mentioned the trouble of backing off on the 1904 model to the Hetherington people years ago when I was with that firm, and I see they have made a change in their latest model.

"W. O. R." says "We know that by detaching later, we take out less waste. Why is this so?" Then he goes on to explain his theory, with which I do not agree and which I will try to show as clearly as possible without criticizing his opinion. The detaching motion does not really pull the partially comber fibers, through which the half lap has just passed, up into the needles of the top comb. For is not the nipper plate on the Nasmith comber a little higher than the steel detaching rollers? Then again, is not the point of the top comb needles set so that they are a little lower than the top of the steel detaching roll, or until the depth of the top comb raises the 6/1000ths or 25/1000ths gauge about 1/16 of an inch off the steel deaching rolls? Also, are not the top comb lifters set at from No. 10 to No. 13 on the index according to the cotton being worked or the quality of work desired, so that the top comb will begin to penetrate the cotton as soon as possible or immediately after the detaching rolls grip the combed tip of the lap? When backing off very late, it will at times be found that the sliver in the sliver pan will show where the piecing has been made, owing to the tips of the fibers being presented to the bite of the detaching rolls before the rolls start their forward movement and the tips of the fibers get a little curled. This same thing will occur when the top comb penetrates the cotton too early and stops the rolls from gripping the fibers immediately.

The waste will only be decreased by backing off later when running cottons from 1¼-inch to 2-inches in length. On short cottons it is not necessary to back off later than index No. 1. Even on 1¼-inch cotton the evil of the half lap catching the returned sliver is removed by backing off at index 1¼, but as I stated in the earlier part of my letter, that method is not correct, and the best thing to do is to move the cylinders forward a sufficient distance to overcome the evil according to the length of the staple worked.

In paragraph No. 4, "W. O. R." says: "Therefore, by detaching later than one and nine the fleece is not brought into contact with the top comb until it is very near the tail end of the fibers. This will make less waste by allowing much to go through that should be waste, but that is not proper combing." "W. O. R." will find himself mistaken in the foregoing claim, as I will try and show.

First of all, I will admit that when working medium and long cottons, the waste percentage can be reduced by backing off later, for that delays the return of the previously combed sliver until the last rows of needles of the half lap have passed by. But that does not say that the combed tip of the lap is not brought into contact with the top comb until it is very near the tail end of the fibers.

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the setting of the top comb lifters, whether they are set at either Nos. 10, 11, 12, or 13, are so set, that the time the comb enters the cotton is *supposed* to be correct for the benefit and quality of the work desired. Well then, in the first place, if the comb enters the cotton immediately a piecing is about to take place, and all that is changed is the time of backing off making it later, then the timing of the top combs are still the same, and they come in contact with the tip of the lap at just the same time, *only* just before a piecing is made, through the detaching roll being timed to back off *later*, making the detaching forward movement *later*.

Theoretically, it can be claimed that more waste is made, because the top comb has a better chance to enter the cotton before a piecing is made. Of course that will be hard to prove, for the amount will most probably be as much as the variation of two consecutive days sizings. Then again, if backed off later to save good cotton from going in with the waste, the amount of increase probably made by the top combs, as stated before, would be lost by the amount saved in backing off later. If the quality would allow it, the top combs could be timed to enter the cotton a little later in proportion to the amount backed off later.

On a Nasmith comber, if the waste percentages is being changed either one way or another, the nipper plate should always be moved for any change over one per cent. Up to one per cent, I would recommend to a man who understands the comber, to try and make the change with the top comb, if he has not gone the limit, but angles should not be resorted to for that is not necessary on this type of machine.

I hope that "W: O. R." finds my letter interesting and valuable, and that it helps him in his efforts to learn more about combers and combing. I would at any time be willing to answer any of his problems.

JOCK (MASS.)

Using Steel Harness on Heavy Work.

EDITOR COTTON:

I have carefully studied the question of "Contributor No. 1041" with reference to steel harness breaking warp ends on a 16-ounce duck, 20 per cent size.

We have never experienced the trouble referred to, but have had trouble with a broken end whipping over others and holding them so that the harness would break out others. It is possible that this is his trouble. On the weight duck he is running, I suspect he is placing a lot of tension on the warp and strapping the harness tightly. Unless his yarns are very free of knots and imperfections, there are probably a good many broken ends, and if so, they are very probably causing most of the trouble.

As there is practically no "give" to steel harness, that is, the type we are using, any tangling of broken ends at the back will cause the ends interfered with to be cut by the heddles, especially so if the warp is run tight. By using a weaver's knot in spooling, keeping slugs out by correct setting of spooler guides, and keeping the breaking strength of the yarn up to standard, we practically eliminated this trouble on our looms.

I do not believe that his trouble is caused by improperly polished heddles or the percentage of size used, as we use 22 to 24 per cent size on some of our 29-inch, 12-ounce duck, which is about the same weight as that he mentions.

The setting of the harness might cause some trouble, but unless the cams or rolls are badly worn, causing the harness to jump, I do not believe this could be the reason. We had some trouble with ends being broken from having the whip roll set too high, and did a good deal of experimenting before we arrived at the best position for it, to give the cloth desired. CONTRIBUTOR NO. 99.

EDITOR COTTON:

This is in reply to the question with reference to steel harness cutting the warp ends, on 16-ounce duck, which was published in COTTON. I suppose it would not be fair to criticize this man for running steel harness on this construction, as it is up to him to do it. I have had a lot of experience on steel harness, but not with weaves as heavy as this man is running. Steel harness are all right on the class of weave they were intended for, such as prints and light sheetings.

This man does not state if he runs a vibrator on his let-off. If he does, this is the correct way to set it: Push the lay full ahead so the pitman arms will be straight from the crank shaft to the lay. Set the end cam just so it will be lowering the vibrator arms as the lay is about to leave the fell of the cloth.

I will say that this man is running quite a heavy sley for the size of yarn he is using—3,492 ends of 9.75s in a 38-inch width. He will see a lot of difference in his work when he has run out a couple of sets of warps. For there is nothing that will polish the heddles as good as running them, and the longer he runs them the better his work will run. It will surprise him.

He wants to run a much heavier size on steel harness than on a single thread stop motion.

Setting of the harness has quite a lot to do with the running of steel harness. To set the harness, stop the loom, break a thread out of each harness near the selvage, turn the loom until one harness is full down. Now adjust the harness so the heddle will drop through the oscillator about three-eights of an inch, then throw the loom over and adjust the other harness the same way. Now, put the heddle bars level and set the reed about three inches from the fell of the cloth. Care must be taken not to get the harness too tight as they will not run as well as if they are quite loose.

The heddle bars should be straight so the heddles will work easily on them. If troubled with overshots at the selvage, the harness should be set a little faster, say 3½ inches from the fell of the cloth.

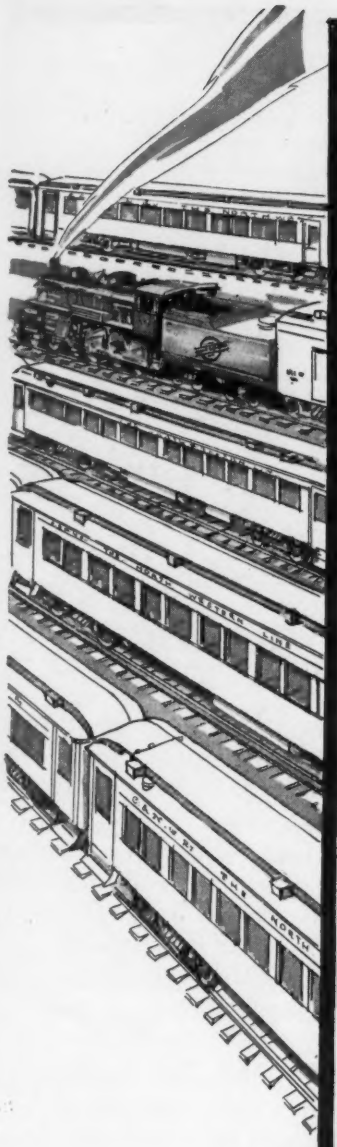
The lease rods should be run about nine inches from the back harness. This will relieve a lot of strain on the yarn. This setting is for a 40-inch loom.

One thing I wish to lay stress on is to look after the size and get it heavy enough and see that it penetrates the yarn in good shape, by running the slasher quite slow. As I said before, steel heddles require more size than cotton harness.

If this man derives any benefit from this, I hope he will let us hear from him. If he wants a good size formula I will be glad to send him one. P. T .S. (MAINE)

EDITOR COTTON:

I note the question of "Contributor No. 1041" about



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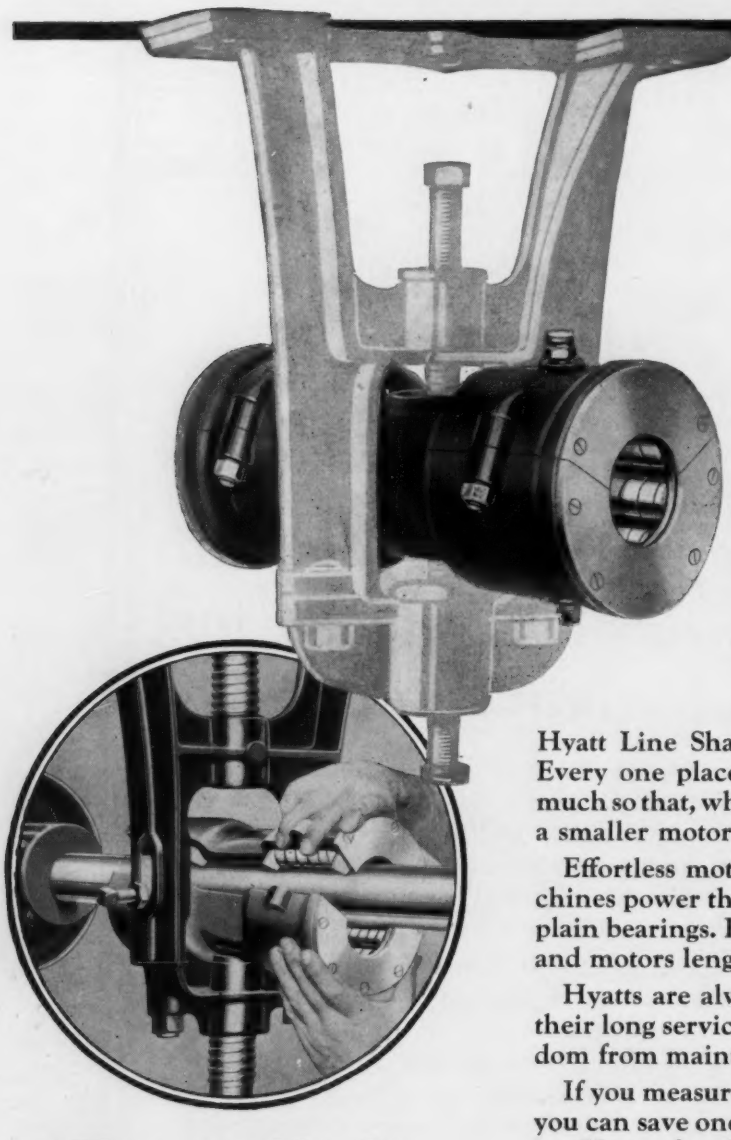

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Some weaker cotton
That you want
To push through
Without it doing
A lot of harm.
As I said
Just before
It is an art.

steel heddles cutting the warp ends on 16-ounce duck. We make a 60x56, with 12s warp and 12s filling which is a mighty difficult weave, and we get away with it very nicely using the same kind of steel heddles he has at his mill. We are also using some cotton harness and can see no difference as far as running goes.

This man has a bad weave. He has 3,492 ends in a 38-inch width, and has about 92 sley, and makes it worse by putting 20 per cent size in the warp. He no doubt has to run his whip roll up high to get his picks in and for cover, and this causes a great strain on the lower shed when the harness is down as far as it will go. If he will get the whip roll down to as near level as possible it will help a lot.

I don't know whether or not he has a vibrating whip roll, but if not, if he could get one that vibrates with a lever and cam from the crank shaft, and set it to slacken the yarn at the point of greatest strain, it would be certain to help.

But, to be frank, he is putting on too much size for this weave, and there can hardly be any elasticity in the yarn after drying on the slashers. Of course this is my point of view from a long distance, without knowing other conditions, but if possible, I would cut the size to about 8 to 10 per cent and even less for a duck weave, provided the weave will stand it, as he must have trouble with draw-backs.

In order to find out whether or not it is the harness causing the trouble, he can try a cotton harness using four shades to the set. A good way to find out if it is the eyes is to tie a red string on each eye where the end breaks out; after a dozen or so of these are tied, he can see if it is the same ones breaking all of the time. I would also take a strong magnifying glass and examine the eyes for ragged edges or splits in the top of the eyes.

This is about all I can think of now, and hope there is something that will help. I know he will say that his size is all right, but my experience on duck is to keep the size down; in fact, where the yarn is strong enough, some men do not run any size. About two weeks ago I helped a fellow by telling him to cut out all of the size and just run it through water with just enough starch to make it milky-looking; but that was on two-ply yarn.

CONTRIBUTOR No. 100.

EDITOR COTTON:

Answering the inquiry regarding steel heddles:

My suggestions are, on the heddles, gauge the steel ribs from the wood frame so that the heddles will have plenty of play on the ribs. See how much space there is between the steel rib and the wood frame at the end where the rib is stationary, and then make this space about 1/16-inch more, both top and bottom out at the adjustable snap hooks—this to allow for the frame springing out when hooked up on the loom.

This should stop most of the trouble, but he will still have a little of the end cutting, but not as much as from cotton harness—some of them are nearly always worn out. The heddles must at all times be free to adjust themselves on the heddle bars. Also, his 20 per cent of size is too much. If he must use that much, he should add more softener.

CONTRIBUTOR No. 101.

EDITOR COTTON:

This is in answer to the question of "Contributor No. 1041", who said he is having trouble with steel harness cutting the warp ends.

The 20 per cent size he is putting on seems to be pretty heavy, and is liable to give trouble in the weave room unless it is handled right. If he is using sufficient softening material, and leaving enough moisture in the warp to keep it from being brittle, the trouble should not be from the sizing.

I would suggest that he examine the harness to see if the ribs are tight enough to prevent free and easy movement of the eyes. If they are too tight, they become crowded in places, and a spooler knot or a little slug of almost any kind is liable to break out a number of ends.

The eyes should be loose enough to adjust themselves to the spread of the yarn, but not too slack, as this will cause undue wear on the ribs.

I am sorry I cannot offer any positive relief for this trouble. We have never had any trouble of this nature, and therefore we have had no especial necessity for overcoming it. We have been using steel harness for about five years, and the results have been very gratifying. We manufacture duck and osnaburgs.

When this contributor overcomes his trouble, I would be glad if he would tell his remedy through COTTON. We might have the same trouble some time.

CONTRIBUTOR No. 102.

EDITOR COTTON:

On page 364 of the February issue, "Contributor No. 1041" wanted to know what causes steel heddles to cut the warp on a 16-ounce duck, 9.75s warp, 3,492 ends, cloth 38 inches wide.

This sley and width gives about 91.89 ends per inch in the cloth. Of course it will be some less in the harness, say

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about 86. The diameter of a 9.75s warp thread is 1/90.5 inch, less 10 per cent for compresson, gives 1/81.45-inch, which means that 81.45 ends can be laid side by side in one inch.

Turning the loom slowly by hand, it can be seen when the shed is passing center that the yarn pauses, then the shed snaps apart and when the loom is on speed this is the time that the ends break. This can be remedied by one of the rows of each pair being raised 3/16-inch so that half of the yarn on one harness will pass at the center of the shed 3/16-inch before the yarn on the other harness. I am under the impression that the two rows of heddles are on one heddle bar. If this is so, another heddle bar could be fitted into slots at the end of the harness frames 3/16-inch higher so that one row of heddle eyes will be 3/16-inch higher than the other row of heddle eyes.

I have had trouble similar to this with cotton harness, when running the harness in pairs of $2 + 2 = 4$. One harness of each pair was raised 3/16-inch, and the breakage of ends and floats were reduced immediately. We called this "slattering" the harness. L. J. (MASS.)

Fly Frame Cones and Presser Fingers.

EDITOR COTTON:

We were treated to a "Little Fly Frame Discussion" on page 278 of COTTON for January, and this was signed by our friend "Wash (R. I.)," who, by the way, I notice, has gotten into the way of classifying some of us fellows into our various capacities in the cotton mill.

I notice in his article that according to his belief I must be a card man, and he seems to have gathered this information from what I stated in the 9th paragraph of my "roving tension" letter published in the October issue of COTTON.

Now who, I ask, would think of cards when dealing with the fly frames? "Wash" should stop guessing and leave the subject of what any of us fellows are in the mill, and stick to the subjects at issue. Then let me remind "Wash" that it isn't what position a man holds that counts in these discussions, but what he professes to know about the matter being discussed. I know a man who at the present time has to take any old job, but still he knows the loom from *a* to *z*, both in a practical and theoretical way.

The foregoing is just a little, not discussion, but introduction before I start to answer "Wash's" question.

Let's see now. He states that in the Saco-Lowell catalog it tells us that for a "12 x 16 slubber the cone belt should be started at a point 1⅞ inches from the extreme starting point of the cones," presumably from the large end, and the distance for a 6 x 3 jack frame is 6 5/32 inches. Now I am wondering if "Wash" is trying to kid me or if he really was in earnest when he thought of stalling me with a question of that description.

Anyhow, I know his idea, as so many more readers will readily see, in asking this question.

He has simply chosen the statement of the Saco-Lowell Company regarding the positioning of the cone-belt in order to upset the belief of "K. F. F." and myself that the belt should be always started at the end of the cones at the beginning of a set.

Of course, I thought he would know that at best I realized that the approximate diameter of the empty bobbin would be in use when the belt was started thus, though by

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his remarks he thinks I belong to those who are always wrong on this subject.

Now for my reply to his question concerning the Saco-Lowell Company's adoption of the various positioning of the cone belt on different frames. Well, it may not be generally known, but I am lucky enough to know that the Saco-Lowell Company use four distinct cones for the various frames they build, namely, slubbers, intermediates, fly frames and jack frames. The large and small diameters of both top and bottom cones are different to accommodate the different sizes of bobbins and counts of roving being made on these frames, but the cones are of the same length.

"Wash" asks why Saco-Lowell have figured a cone belt setting of 1⅞ inches from the end on a 12 x 6 slubber. My answer to that is because they use a 2-inch diameter bobbin on the latter, and positioning the belt thus gives the approximate bobbin revolutions at the beginning of the set. Had he given me a little harder problem, say for an 11 x 5½ bobbin, and asked me where the belt should be set for the beginning of the set of bobbins, in this case I would tell him that the starting point of the cone belt is approximately ⅞ inches on the slubber cone. Why? Of course "Wash" will know perhaps. Anyway, for the benefit of other readers, I may say that this is because the barrel of an 11 x 5½ bobbin is 3/16 inch less in diameter than a 12 x 6 bobbin. Get the idea? Surely you have, and of course you will see now that the reason the Saco-Lowell people set the cone belt on jack frames at 6 5/32 inches from the end of cones is because this position is approximately correct for the diameter of the bobbin used, namely, 1⅞ inch in diameter. This setting would have to be altered say for a 1½-inch diameter bobbin. I wonder if I have answered "Wash" as he so desires, as I have left out all mention of gearing as he stipulated in his question.

However, I also notice in this letter by "Wash" that he advises me to study his article on "The Effect of Excess Speed on Fly Frames" and especially the fourth paragraph. I have done so, but I am sorry to say I find there little to study. Anyhow, we will just go over a few points in this paragraph, as it deals with a very important part of this discussion, that is, according to "Wash's" statements. This paragraph first of all tells us that "all practical speeder men" know the theory of the flyer. By the way, practical men as a rule do not have very much use for theoretical principles. Anyhow, "Wash" states that the presser rod attached to the hollow leg is made heavy. How heavy? Does he know?

However, he says it is made heavy, and at the same time the greatest distance from the spindle, so that when the spindle revolves the heavy rod will try to fly outwards, due to centrifugal force, and this he says causes the presser finger to exert a slight continuous pressure on the bobbin surface. Only slight, mind you.

According to the latter statement, if we run a set of flyers and a set of empty bobbins we shall always find that the presser fingers on every flyer will be exerting a slight pressure on the empty bobbin, in fact, the greatest pressure, due of course to the tendency of the presser rod wanting to fly outward.

Perhaps "Wash" has noticed, say on a slubber, when a bobbin has got a layer or so too small on account of an end breakage, the tender has, by putting one turn less on the presser finger been enabled to run that same bobbin easily because very soon it reaches the size of the rest of the set. Now it seems, according to ideas "Wash" has stated, that the pressure which was exerted on that diameter of bobbin, would be more than on the diameter of the bobbin, say one layer larger, and therefore condensing the strand slightly more, keeping at the same time the bobbin smaller than the rest, which would mean that it could not be run.

Still it is made to run when one less turn of roving is put around the finger. Now what exerts the pressure? In reply to "H. D. (Mass.)" I would say that his drawings explain nothing to me regarding this point. D. E. (R. I.)

Sizing Warps Without Starch.

EDITOR COTTON:

In reply to the question asked by "Contributor No. 1038" in the February number of COTTON in reference to sizing a warp without starch, will say that I believe there should be no trouble in overcoming this difficulty. There are several gums used, mostly in calico printing plants; some are used in color mixtures, but the one to which I refer is gum tragacanth.

About twenty-five years ago the writer was employed by one of the most up-to-date works in Massachusetts. We then made some very extensive experiments on yarn printing on a regular 9-roll machine. Some of the sets were 50/1 and others mercerized up to 100/2. The pattern called for mostly six colors, using a plain gum roller for the last nip coming out of the printer, dried on cans, then run on a dry slasher head onto loom beams. No starch sized warp could be better.

More detailed instructions as to dissolving the gum can be had from A. Klepstein, Arnold- Hoffman & Company, or any dealer furnishing the material, or any color mixer. And just at this time let me state I am surprised that some mills, especially those who have printing plants, have not experimented with cold liquid gums for sizing some of their goods on the slasher. Of course the cost has to be taken into account.

I would suggest also that "Contributor No. 1038" use his heaviest squeeze roll on the back, for after long experience, I have found it to be true that one gets more penetration by squeezing it (the size) with the yarn, as well as leaving the sheet dryer to lick up as much more size as should be good for the construction, at the finishing squeeze roll. Gums should all be used cold.

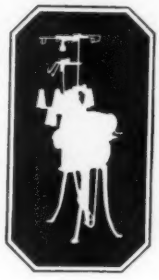
I trust this will be of some assistance to "Contributor No. 1038."

MACK (GA.)

"Fast Dyes—Why, When, How?" is the title of a booklet just issued by E. I. du Pont de Nemours & Company, Wilmington, Del. It consists of reprints of an article appearing in Good Housekeeping, giving the result of that magazine's study into color fastness in fabrics; and articles from other publications dealing with the Joint Committee of the Textile Industry, which presented a tentative plan for the establishment of standard tests and classifications for color fastness. The booklet covers the progress made in this direction, and is of interest in that respect to those concerned with dyeing. Copies may be secured upon request to the du Pont company's offices.

E. C. LITTLE, formerly overseer of carding at the Glenn-Lowry plant of the Aragon-Baldwin Mills, Whitmire, S. C., has become overseer of carding at the Ninety-Six Cotton Mills, Ninety-Six, S. C.

Knitting Section



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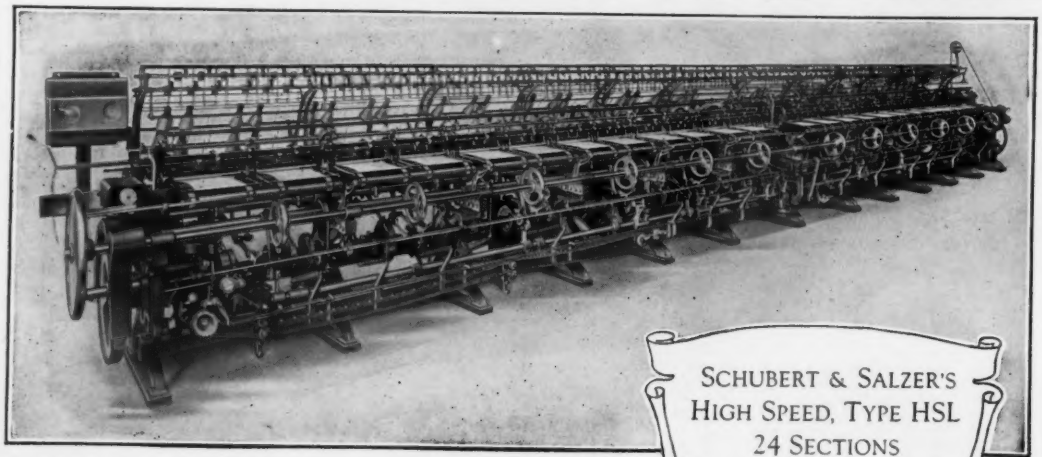

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The Rib Warp Loom

BY WILLIAM DAVIS, M. A.

The products of the rib warp loom occupy a position in the knitting industry which shows a tendency to increase in importance and this increase would undoubtedly be more rapid if knowledge concerning this very interesting type of machine were more general among manufacturers. The plain warp loom has an extended use in the industry but the rib variety has many points of excellence to commend it. The varieties of texture are greatly increased, fabrics heavy and light can be produced, and above all the peculiar structure of the machine renders it possible for fabrics of double cloth characters to be designed.

The term rib as applied to this type of machine is something of a misnomer as it is scarcely a rib fabric as one

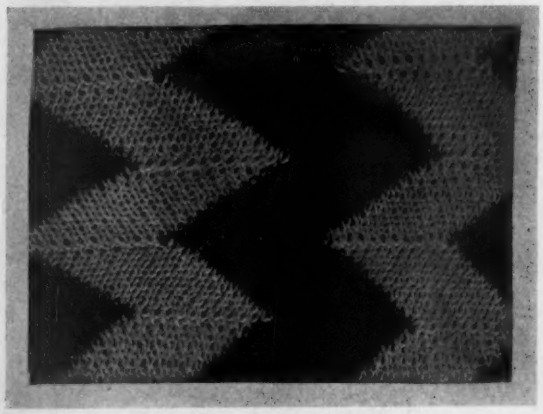


Fig. 1.

understands it in the knitted fabric industry. In the ordinary knitted rib, there is one ground thread only which is shared by the plain and rib needles at the same course of loops. The rib warp loom, however, has two needle beds which do not rise and fall at the same time, but which operate alternately, first the right-hand bed comes up and as it is discharging its stitches the left-hand bed rises and so on all the way through. The left-hand bed knocks over its stitches towards the right, and the right-hand bed knocks its stitches over towards the left. This difference in the direction of loop discharge gives a ribbed appearance to the fabric but each side is distinct in its loop formation and that is a great advantage because each can be made quite separate from the other as regards pattern and texture. There is also the advantage that one bed only may be employed should this be found desirable and a fuller use can thus be made of the machine.

In plain work, however, there are excellent machines using the spring needle, which are esteemed by the trade as being the best types for producing plain work. The spring needle used as a knitting instrument is still unsurpassed and when this can be employed it is advisable to use it. In the spring needle the process of loop formation is more complicated and troublesome, but the resulting texture is always more dense and compact than that from the latch needle variety, there is also less tendency for the products of the spring needle to ladder and unrove. If the thread breaks, it remains to some extent local in its effect, unless very definite and determined efforts are made to make it run.

Figure 1 gives a view of a plain warp loom fabric which is an example of a type always more or less in demand and which is made on this warp loom with the greatest of facility. A further step will also show how this vertical zigzag when made with two bars on two needle beds with plain and rib needles can be combined into diamond designs where the diamond stands on its edge. Fig. 1 has its threads arranged in the eyes or guides of the warp loom as follows: 11 brown, 1 red, 12 white, and this arrangement can, of course, be simply made into a vertical stripe by giving a simple one-and-one Denbigh lap. This is the simplest lap possible where the guide bar moves under one needle and swings through to lap its thread over the next. At the second course, it retraces its path and lapping under one needle, swings through and lays its thread over the needle it missed at the first course. This is the simplest form of interlacing possible between the threads but is quite sufficient to insure a perfect connection of these separate warp threads into a complete texture.

In Fig. 1 the guide bar is given a side-to-side motion where the bar laps one needle space towards the right for twelve courses in succession. Then retracing its path it moves back again one needle space at a time and arrives at

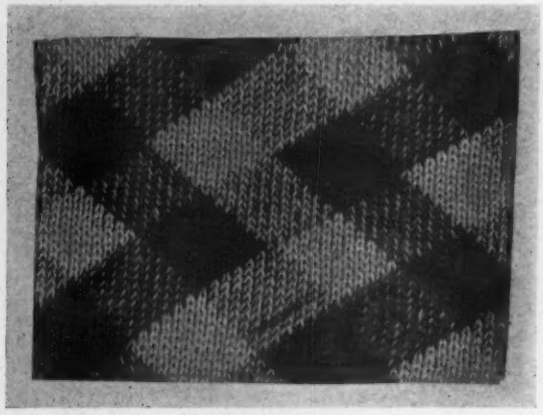
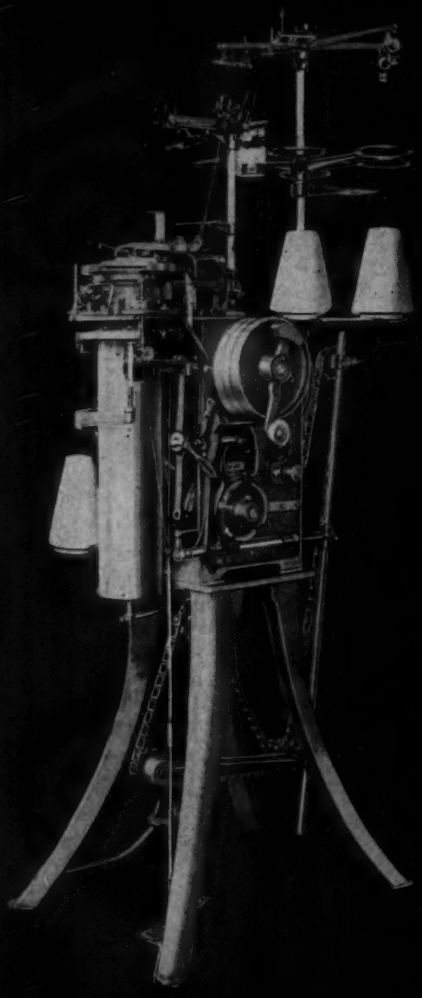


Fig. 2.

the first needle when the pattern is repeated. Where the turn-back of the pattern takes place it will be noticed that there is a slightly larger opening across the fabric due to the altered form of stitch produced by turning, but this is not such as to constitute a defect or blemish in the fabric.

The texture can be altered in two ways: (1) by increasing the thickness of the yarn used on the machine, and (2) by increasing the number of courses per inch in conjunction with a shortening of the stitch or loop. The warp loom has a great range of possible textures starting from the gauze-like fabric produced by using a yarn thin in relation to the gauge or set of the needles, and at the upper end of the scale thick yarns can be employed which can be stiffened to yield a texture with very little stretch. The elasticity is always greater in the direction of the width than in that of the length and if very robust fabrics are re-



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quired, they can be made very well on the rib form of this warp loom.

One remarkable item is the relation of the length of the warp to that of the fabric produced. For ordinary textures, three yards of warp are required to give one yard of fabric, but if double laps are used, the take-up of the warp is greater than that, 500 yards being often required to produce 100 yards of cloth. In extreme laps, such as are customary in the shawl trade, the take-up of warp is still greater, 12 yards of warp being required in some patterns to produce a pattern one yard in length.

Figure 2 is given to illustrate the next stage in a warp loom production and it is the same pattern as already produced with the addition of a second needle bar set at an angle to the first and with the latch needle as the knitting instrument. In this case there is a second warp with exactly the same pattern as the first, namely: 11 brown, 1 red, 12 white and the two guide bars are given a movement contrariwise to each other; one is moving towards the right when the second is going towards the left and vice versa. The right-hand needle bed comes up and receives its lap while the left-hand one is down and vice-versa. The result of this addition is evident in the difference in the appearance of Fig. 1 when compared with Fig. 2, for the stiffer rib stitch has the effect of drawing the texture together and there is very little extension of the pattern in the width as is noted in Fig. 1. There is some elasticity in the width of Fig. 2 but almost none in the length and the whole handle of the pattern has been immensely improved by the alteration from plain to rib stitch.

But this intermingling of the threads from the two warps has given rise to a very effective kind of pattern where the colors mix and the patterns have the following features: There is a solid diamond of white, side by side with a solid diamond of dark brown, there is a diamond where the white predominates on the face of the rib with the brown on the base, and another diamond where the reverse holds good and a dark brown predominating on the surface of a diamond with the white base. Then the red thread from one bar meets the red thread in the second bar and together they form an overcheck which is distinctly pleasing and certainly an acquisition to the style of pattern.

If the pattern be examined in a vertical direction the following segments can be clearly distinguished: (1) A solid diamond of dark brown alternating with one of solid white. (2) A succession of daimonds where a white face is underlaid with a dark brown base. (3) An array of diamonds where the face is dark brown blended with white in the base. This pattern is typical of many which can be produced on the warp loom using two needle bars.

To make the construction of this rib warp loom more clear, there is given in Fig. 3 a section of a machine known as the "Hobley" which is largely used for fabrics of this description. The warp rollers are arranged high above the machine and not shown in the sketch. The warp threads are drawn one by one through the sleys marked S_1 and S_2 in the sketch. From here the threads are passed through the eyes of the guide bars, of which there are two in number, marked GB_1 *and* GB_2 respectively and one guide point in each is given by G_1 and G_2. These points have an opening at the end through which the threads of the warp are passed seriatim but they are not totally enclosed, as at the back of each is a narrow slit through which the entry of the

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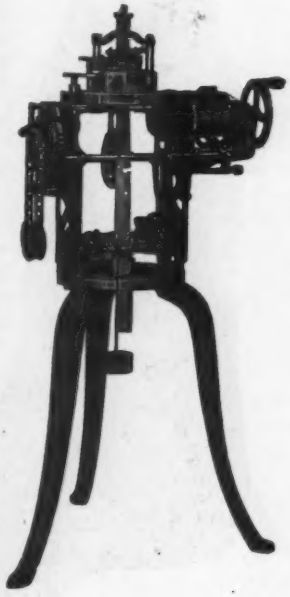

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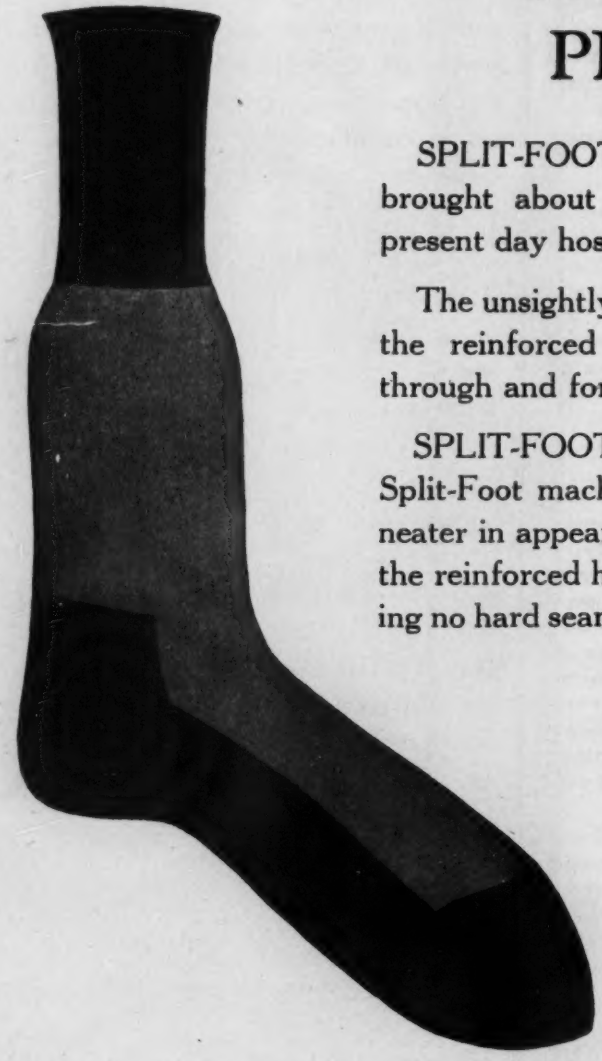

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The unsightly inside fringe of splicing ends in the reinforced portion which tends to slip through and form whiskers on the outside.

SPLIT-FOOT hosiery made on "BANNER" Split-Foot machines is smoother on the inside, neater in appearance and has added strength at the reinforced high splice and double sole, having no hard seams.

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thread into the eye of the guide is greatly facilitated in threading up.

Below the sleys are hung the arrangement of parts in which the various guide bars are housed and from which they are operated, but only two of those housings are shown in use, namely, those for guide bars one and two, GB_1 and GB_2. Passing through those bars are shown the threads marked T and T_1 representing one thread from each of the two warps respectively. These ends are noticed

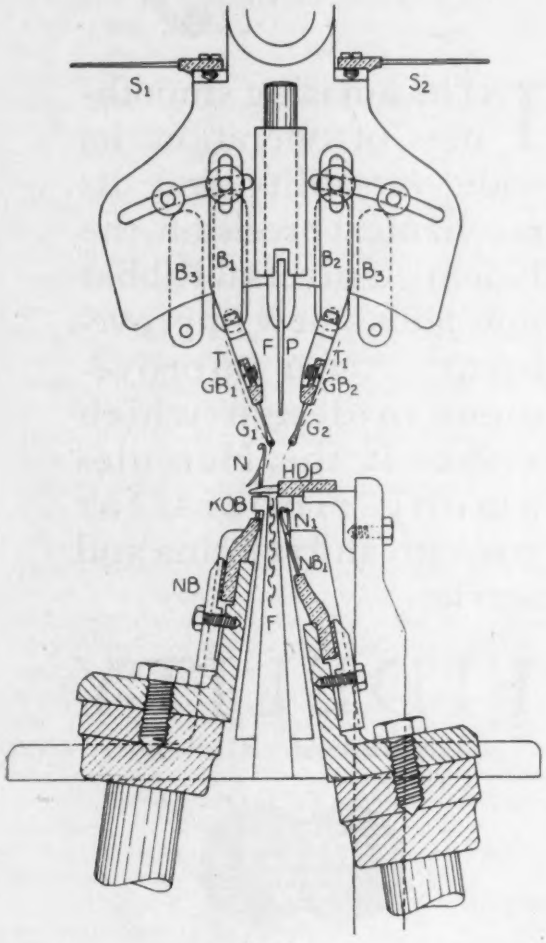


Fig. 3.

to be passing through the eyes of the guides marked G_1 and G_2. From here the threads move into the needles of the machine and these are shown in two series, one marked N on the left which is connected with a lead and which in turn is fixed in the left needle bar NB. This arrangement is duplicated on the right in N_1 and NB_1 which is shown here at the low position occupied in knocking over. The left-hand needle bed is given in the higher position in which it is receiving the lap from the movement of the guide bars between and over the needles. The fabric F is noticed to be passing down between the two beds and this is drawn away by tension on a fabric roller below, or in front of the machine.

Between the two guide bars GB_1 and GB_2 is suspended a plate named the faller plate FP which has an up and down movement when required for what is known as faller plate work. In this variety a course of loops is inserted and the faller plate being a solid bar comes down and pushing the course downwards draws it out to a greater length. This gives a raised effect in the fabric which is sought after for certain styles.

Vital parts of this machine are the $K\ O\ B$ or knocking-over-bits of which there are a set for both right- and left-hand bars. These do not actually knock over the loops but merely act as supports for the fabric stitches to enable the needles to descend to draw their loops through.

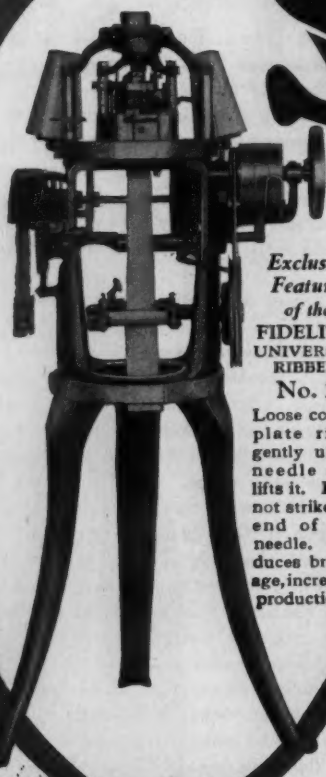
Another important set of points is shown at HDP known as the holding down points, the chief function of which is to hold down the newly-formed course of loops on the needle stems while the latter are rising into position for a new lap.

The formation of a complete set of loops may be summarized as follows: The guide bars sweep through the needles and move sidewise one needle space and swing back again through the needles. The threads are thus laid into the needle hooks. (2) The needle bar draws the needles down in a body and in so doing the fabric which has, up to the present, been lying on the lower stem, closes the needle latch as the latter drops. (3) The needles are drawn down still further between the tricks of the knocking-over-bar with its bits $K\ O\ B$ and the new stitch is pulled through. (4) At this point the needle bar on the right side has moved up into position to receive its lap and at this same moment the needles in needle bar NB are drawing through their loops by passing downwards between the points of the knocking-over-bar KOB. As the needles are rising, the holding-down-points HDP keep the newly-made stitches on the lower stems which clears the way for the clean reception of the new thread from the guide bar. The movement of the guide bar is of a double character, (a) it is shogged sidewise over the needles, and (b) it swings outwards and inwards between the needles.

In many machines of this class, the sidewise movement is obtained from the famous Dawson wheel where successive elevations are made to the rim to give the laps desired. In this machine, however, a chain is employed where to lap one needle space a link of height number one is employed. For a further lap to the left a link of twice this height is needed and so on, a higher link for every successive stage towards the left. When it is required to retrace the path of the bar then these links or studs are inserted in gradually reduced heights and a stout spring at the side draws the needle bar towards the right. This belongs to the category of negative motions which are often condemned by the theoretical engineer as being unsound mechanics, but it appears to work all right in practice. Its defect, of course, lies in the fact that after, say, 12 or so laps towards the left, the stout spring is exerting an ever-increasing drag on the bar and the pull on the return journey is keener with the longer laps than with the shorter ones.

The introduction of the chain enables a larger number of patterns to be made and one does not encounter the difficulties of construction inherent in the making of Dawson wheels. In these larger laps the ragged edge is a trouble and is regarded with disfavor for many purposes. One method is to use a selvage which is warped on separate narrow rollers at each side of the warp and this is operated with a simple lap which gives a comparatively straight edge, but as it is of a different pattern to the ground, it is not entirely satisfactory in practice. In many

Sturdy!



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warp loom fabrics with a large lap the only remedy is to cut the zagged piece from the edge. This is one of the drawbacks to this type of texture and it creates considerable waste.

Among the Knitting Mills.

A meeting of some of the full fashioned silk hosiery manufacturers of Philadelphia was held in the early part of March to act on a report of a committee appointed at a previous meeting on a proposal for forming an organization of Philadelphia mills to deal with questions relating to recognition of the full fashioned hosiery knitters local union. It was the purpose of the committee to obtain manufacturer sentiment on the proposal. The latter meeting was attended by representatives of 28 mills—union, non-union and open shop, the two latter classifications predominating. No action on the proposal was taken, which is construed as meaning none of the mills not already unionized will deal with the organized knitters. Three of the Philadelphia mills operate with non-union operatives exclusively and are running 100 per cent. One is being picketed, but while operatives are subjected to some humiliation when entering and leaving the mill, there is no disorder and the employers are in no way molested. On one of the open shop mills there is displayed a placard stating "This is an open shop. We want our employees to make all the money they can. Waste must be eliminated." This mill also is having no difficulty in having all of the machines manned by skilled knitters.

During the meeting of manufacturers there was submitted a suggestion that a wage scale revision be given consideration, and several manufacturers suggested curtailment of output for a time. No action on either proposal was taken. Several of the manufacturers present said they could not conveniently reduce working hours; that, while operating overtime, they were selling their entire production. A majority of the non-members of the Philadelphia Textile Manufacturers' Association at the meeting since have become members, but most of them with the distinct understanding they will lend no encouragement to union recognition.

Paducah Hosiery Mills, Paducah, Ky., are to operate a branch plant in Murray, Ky., it is reported.

W. B. Davis & Sons, Inc., are building a 60x200 foot addition to the plant at Fort Payne, Ala.

It is understood that an addition, 160x30 feet, is being built by the Egan Cotton Mills, College Park, Ga., to be equipped with knitting machines for the manufacture of laundry padding.

R. O. Huffman and others, of Morganton, N. C., have definitely organized the Morganton Full Fashioned Hosiery Company, with a capital of $300,000. Full fashioned machines will be installed.

Clyde Wilkins, president of the Champion Knitting Mills, Chattanooga, Tenn., heads a new company known as the A-One Hosiery Mills, which will lease a building and install machinery to manufacture 500 dozen pairs of hose a day. The capital is $100,000.

Lawler Hosiery Mills, Carrollton, Ga., operated by T. J. Lawler, formerly of Villa Rica, Ga., have been taken over by a company with the following officers: B. F. Boykin, president; T. J. Lawler, vice-president; P. L. Shaefer, secretary-treasurer. The capacity of the plant will be doubled under the new ownership.

Ray Hosiery Mills, Asheville, N. C., have been incorporated by W. Y. Frazier, C. A. Ricks and C. S. Kinsland.

Pauline Knitting Mills, Valdese, N. C., have purchased 25 additional knitting machines, which are being installed.

A brick warehouse, 200x50 feet, will be erected by the Holston Mfg. Company, Knoxville, Tenn., at a cost of $12,000.

W. H. Sanders, Elizabeth City, N. C., is organizing a silk hosiery mill.

As forecast last month, F. Osborne Pfingst and Frank E. Curran, of Philadelphia, have formed a company known as the Greensboro Silk Hosiery Company, at Greensboro, N. C., and will erect a plant in that city for the manufacture of full-fashioned hosiery. It is understood the plant will cost approximately $500,000.

Volunteer Knitting Mills, Chattanooga, Tenn., have bought the Wellman Cotton Mills, at Athens, Ala. The owners of this company also have purchased the entire spring needle equipment of A. V. Morris & Sons, Amsterdam, N .Y., consisting of 100 Cooper machines, together with auxiliary equipment, which, it is understood, will be removed to Athens. The capacity of the yarn spinning plant purchased there will be increased.

Construction work has begun on the plant of the Gardner-Waring Knitting Mills, at Florence, Ala. This company, which was formerly at Amsterdam, N. Y., will manufacture approximately 1,000 dozen garments a day at Florence.

Production will soon begin in the Bristol (Va.) branch plant of the High Rock Knitting Company, of Philmont, N. Y. I. A. Sagendorph is superintendent.

Carroll Mills, Carrollton, Ga., are installing additional manufacturing machinery.

JULIAN ROBINSON has succeeded Thomas Perry as superintendent of the North Carolina Finishing Company, at Yadkin, N. C.

Obituary.

JOHN S. ROBERTS, president and founder of the Georgia Webbing & Tape Co., died at his home in Columbus, Ga., Friday, March 11th. He had been in declining health for a number of years, but was active in the affairs of the mill until February of this year.

Mr. Roberts was one of the conspicuous characters in the southern cotton mill industry. Commencing his activities in the Eagle & Phenix Mills at Columbus, Ga., as a very young man, he remained with those mills for a period of twenty-five years and then became identified with the mills of the Cannon interests, being engaged at Kannapolis and Concord. He subsequently returned to Columbus where he became superintendent of the Hamburger Cotton Mills, remaining there until taking up his duties as Chief Inspector of Cotton Goods in Georgia for the Quartermasters Dept., during the war. Upon concluding these services he founded the Georgia Webbing & Tape Co. He also recently established the Roberts Braiding Co.

Mr. Roberts was a familiar figure at all gatherings of textile men and was especially active in the Southern Textile Association. Few men possessed the instinctive knowledge of the textile industry as did Mr. Roberts and coupled with this talent was keen business judgment and executive ability.

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"My bleach is better than yours."—

"How do you get that way?"—

"Well, my Solozone-white is fast

I do not injure the fibre.

I cut out Seconds.

My goods don't yellow.

They are soft and elastic."—

"You win; but mine costs much less."—

"Wrong again. Couldn't sell much if it did:

I'll turn out three lots to your one,

My labor is about one third,

So is my water and steam and

Cost of equipment—

I bet we'll split even on cost."

THE ROESSLER AND HASSLACHER CHEMICAL COMPANY
713 Sixth Ave. New York

Has Trouble With Uneven Stitches.

EDITOR COTTON:

I would like to have advice as to what causes the very uneven stitch in our full-fashioned hosiery, a sample of which is submitted herewith. The silk we are using is 9-thread Grand Double Extra. I have changed the silk a little and we are now purchasing a higher grade. What I would especially like to know is the cause of the uneven stitch? Is it probable that our trouble lies with the silk not being absorbent, or is it more likely that the fault lies with the machines?

I certainly shall appreciate any information, suggestions and comments that may be made by your readers experienced along the lines indicated. The make of our machines is Ludwig, 42-gauge, making twenty at once. The method we have of applying moisture is as follows: We put the silk on the winding machine dry, and it is wound over a dampening roller which contains a solution of 6 pounds of olive oil potash soap and 2 pints of Philadelphia silk oil. This is made hot and well mixed together. We add 50 gallons of soft water to this mixture and stir well together. It is kept in a cabinet and used as we require it. When the silk has passed over the dampening roller, carrying this mixture, it is taken into a store room and put into steel cabinets, which have a dampening tray at the bottom containing water. Usually it is used up on the knitting machines the same day, passing into a cabinet at the back of the full-fashioned machines. This cabinet also has a water pan at the bottom, and glass sliding doors back and front. The thread comes through the top of the box and passes over to a felt pad which is continually saturated with water. CONTRIBUTOR NO. 521.

Hosiery Inspection Standards.

EDITOR COTTON:

I note the question of your contributor with reference to how far the inspection department should go concerning inspection standards on stockings from the knitting machines.

This question could mean almost anything applying to inspection, but my answer would be that you cannot get 100 per cent perfect work from the knitting machines by inspection on a practical cost basis.

The cost of inspecting is always determined by the class of merchandise that is being manufactured. The higher the class of the merchandise manufactured, the greater are the imperfections and the more important it is to segregate them.

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

On our full-fashioned goods the cost of inspection is about twice what it is on the seamless goods and in all departments our inspecting is charged to oversight. If we have a department where the overseer is burdened down with work, we reinforce him with inspectors sufficiently to see that the work is inspected on as practical a basis as is humanly possible to do, while in other departments where the overseers are not overburdened, we reduce the inspecting accordingly.

Our experience has been that the best inspecting we can have is none too good, and as long as the cost does not exceed the value derived from it, the mill will eventually be benefited.

I might add further that we pay a bonus on about every process throughout the mill for efficiency in workmanship. By way of illustration, would say that an operator is paid from ten to fifteen per cent more for work that is anywhere from 96 to 100 per cent perfect, depending upon the complication of the operation. We were a great many years working out this system but think it is one of the best things we ever did, both from the operators' point of view and for the mill. CONTRIBUTOR NO. 554.

Keeping a Check on Production and Stock

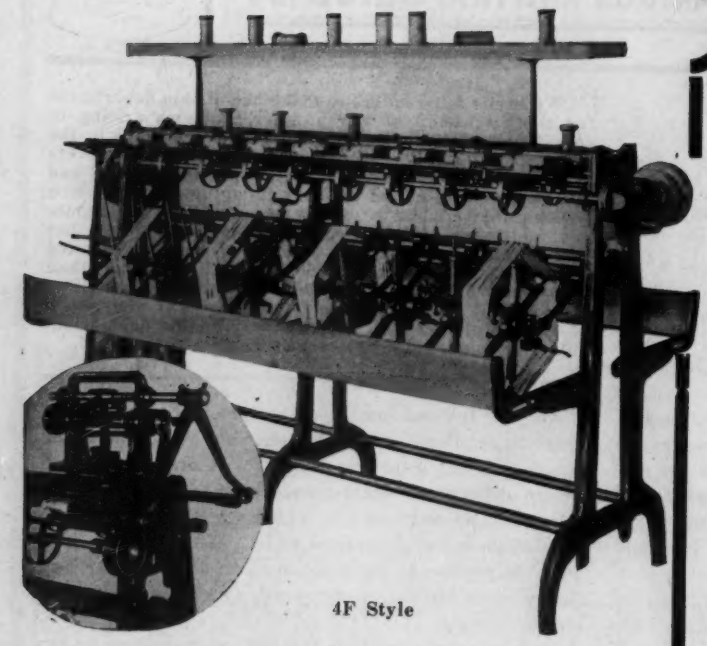
EDITOR COTTON:

Some time ago I sent to "Knitting Kinks" one of the forms we use at our mill for making up the payroll of the knitting room, and you published it, and I notice that you have in your discussion section almost every month some kind of a form or record described and explained by the mill man who is using it.

This time I am submitting the form which we use in order to keep me, the superintendent, posted as to production and the stocks we have on hand of the different styles which we manufacture.

Of course, each man has got to figure out forms that will fit in with his local conditions, and I think most every-

For Sixty Years Atwood Has Served Manufacturers of Fine Fabrics



4F Style

Over sixty years ago Atwood started a little shop that has since grown into a plant producing 80 per cent of the world's silk throwing machinery—doing business with every section of the globe. That Atwood has kept up with the times is proven by the perfection of the 4F Style Rayon Winding Machine. High and narrow and requiring only a minimum of floor space, it is adaptable to either the automatic screw traverse, or the regular patented cam Traverse with adjustable throw. The patented gear gain adjustable swifts, which have proven so efficient, are only found on this machine. These and many more exclusive features substantiate the prestige that Atwood has maintained throughout the world for so many years.

The 5B Spinner

This is a combination Doubling and Twisting Frame for Tram Spinning—hosiery threads in silk, silk and cotton mixtures, and RAYON. Handles materials from 2 to 14 threads. Produces perfectly wound bobbins. Uniformity of production is assured by such improved features as the 2-inch feed roll, spindle swing holder and chain and sprocket drive.

Write for specifications and further information.

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Southern Representatives:

L. H. McCall, Cutter Bldg., Charlotte, N. C.

Built Especially To Wind RAYON

Atwood Machinery in Your Plant Means

Maximum Production
Satisfied Employees
Simple Operation
Minimum Waste
Few Repairs
Quickest Results

ATWOOD

SILK THROWING MACHINERY

DAILY REPORT

PRODUCTION RECORD ⋈ KNITTING ROOM

Date 19

	Section No. 1		Section No. 2		Section No. 3		
	Style		Style		Style		
	D Fixer		D Fixer		D. Fixer		
	N Fixer		N Fixer		N. Fixer		
	Day	Night	Day	Night	Day	Night	Total
Machines Running							
Knitted							
Waste, Lbs.							
Total Wt. Goods							
Per Cent Waste							

	Section No. 4		Section No. 5		Section No. 6		
	Style		Style		Style		
	D. Fixer		D. Fixer		D Fixer		
	N. Fixer		N. Fixer		N. Fixer		
	Day	Night	Day	Night	Day	Night	Total
Machines Running							
Knitted							
Waste, Lbs.							
Total Wt. Goods							
Per Cent Waste							

Total dozens knit (all styles) _____

Looping Room

	Dozen
Total Knit	
Clipped	
K Inspected	
K Mended	
Looped	
Seamed	
L. Inspected	
Mended	

Winders

Lbs. Backwound		Total
SILK	MERC	

Stock Record on Reverse Side

Fig. 1. The Knitting Room Record.

one will agree that it is easy to have too many forms and "systems," that the simplest way of keeping records is the best. At the same time, a certain amount of forms and record work is necessary, and the forms herewith represent the result of my effort to get at the simplest, most efficient and most complete method for this purpose.

The form is printed on both sides, and the side shown in Fig. 1 is devoted to the production record of the knitting room. This is made out daily. Our mill is divided into sections which are tended by fixers, and we also run a night shift, so that provision is made for these two points. You will note that under each section there is a place for indi-

STOCK RECORD

GOODS IN PROCESS

STOCK ROOM No. 1

Style	8	8½	9	9½	10	10½	Total
Balance Forward							
Received Knit							
Total							
To Dye Room							
Balance in Stock							
Style	8	8½	9	9½	10	10½	

Are Your Goods on

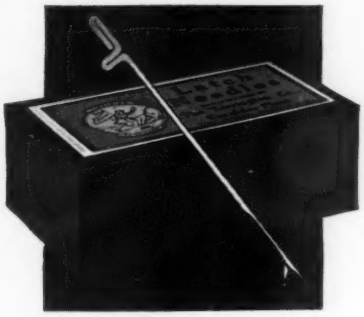
The Street called smart

THE apex of merchandising achievement is to hear a call from Fifth Avenue for your knit fabrics.

Torrington Needles will help you capture this citadel of profitable demand.

Uniform . . . fine tempered . . . smooth. Precision made from butt to latch. These good needles possess the fine points of excellence, the sturdy strength, that knitting requires.

The best proof of these statements is a trial of Torringtons on your own machines. We believe that it is to your advantage to make that test *soon*.



The TORRINGTON COMPANY
Torrington, Conn, U.S.A.

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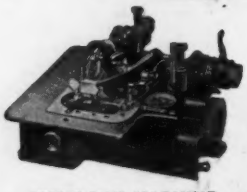
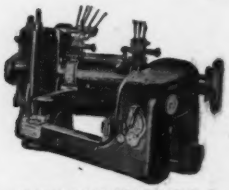
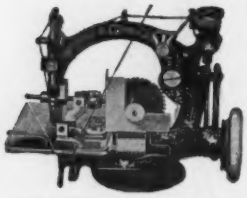
These machines simplify the production of RAYON garments



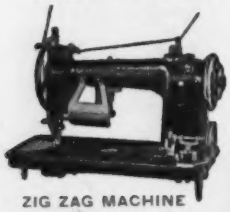
OVERLOCK MACHINE



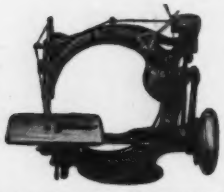
FLATLOCK MACHINE



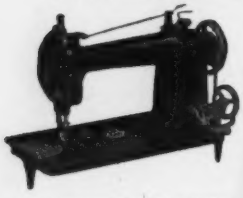
CHAINSTITCH SHELL-SCALLOPING MACHINE



ZIG ZAG MACHINE



CHAINSTITCH MACHINE



LOCKSTITCH MACHINE

SOFT, lustrous Rayon simulates a luxury fabric. That constitutes its popular appeal. Yet this very daintiness may become a liability unless the fabric is properly sewn.

The successful use of Willcox & Gibbs Machines for Rayon by many leading manufacturers is an established fact. These machines finish Rayon to the public's taste—and to your profit. They are constructed to give you the maximum of service, both in quality of work and the high speed which turns out profitable volume.

The OVERLOCK SEAMING MACHINE for making seams that lie flat (without a ridge) to suit the daintiness of the fabric.

The OVERLOCK HEMMING MACHINE for making the elastic and concealed stitch hem.

The FLATLOCK MACHINE for making an absolutely flat seam, which also may be made specially ornamental by the use of sewing supplies varying in character and color.

The SHELL-SCALLOPING MACHINE that provides an attractive finish for the edges of shoulder straps. It makes the fabric of the garment provide its own trimming, and is not disturbed by laundering.

The ZIG ZAG MACHINE for forming an ornamental zig zag effect, for instance on shoulder straps, is appropriate and effective.

The CHAINSTITCH MACHINE with Registering Measuring Tension, for various stitching operations; for instance dividing bottom hem on bloomers for elastic heading, also for sewing on the labels.

The LOCKSTITCH MACHINE for sewing on shields, attaching shoulder straps, etc.

Write Home Office for illustrative samples on Rayon.

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Looping room production by dozens, showing the number clipped, inspected and mended after both knitting and looping, seamed, looped, etc., being given. The pounds of silk and mercerized yarn backwound in the winder department is also given.

As indicated at the bottom of this form, the stock record is recorded on the reverse side of the sheet, which is made up as is shown in Fig. 2.

This also is a simple arrangement. It shows, for each size in each style we have, the number of dozens carried forward from the previous day's report, the number received from the knitting room, the total of these two items, the number sent to the dye house, and then the balance remaining, which is carried over to the next day.

Also on this side I can tell the number of dozens, and what lot numbers were sent to the dyehouse from the stock room, to which all of our knitted work goes from manufacturing and where it is carried until it is ordered out to the dyeing and finishing operations.

I like this form very much. It gives me at a glance the essential manufacturing details about the plant.

T. R. S. (TENN.)

Preventing Water Stains on Underwear.

EDITOR COTTON:

This is in response to the inquiry which you published in "Knitting Kinks" with reference to water stains appearing on cotton and rayon underwear on the pipe drying equipment. My experience is embodied in the following suggestions:

One thing that will cause these water marks is to allow the cloth to stand too long before drying. Also, if the dryer is run too slow they will result, for, as you know, the cloth is in a pile at the bottom before it is taken up over the drying pipe. This can be overcome by running the dryer faster and running the cloth over the pipe twice instead of once as is the usual custom. Another cause is that when the temperature is not kept uniform, water marks will appear.

I trust this will be of interest to those having this trouble, and would be glad to read opinions from other readers. CONTRIBUTOR No. 546.

EDITOR COTTON:

I note the question from your contributor who is having difficulty with water stains on cotton-and-rayon knit fabric, using a pipe dryer equipment, the stains appearing when the cloth is passing from the dry pipe over the spreader to the take-up.

According to our experience, the most satisfactory method of finishing cotton-and-rayon knit fabric is to dry it on a hot air system of the Hurricane type, after extracting the fabric. The fabric is then passed around a spreader to straighten the wales. It is moistened by passing over a steam pipe, which sends out a continuous stream of steam through a .007 of an inch slot (not through small staggered holes). The fabric continues around the spreader which determines its finished width, and passes through two heated cloth-covered steel rolls; the upper roll of which acts in winding it onto a paper tube.

The water marks referred to by this contributor are in my opinion caused by pressing the fabric before it has been completely dried. The fabric also will have a tendency to show water marks if it is not spread out to its proper width as it passes over the dry pipe. This condition has been experienced by us on several occasions, especially with rayon cloth, and to eliminate it we have found it necessary to re-wet the fabric, allowing it to dry thoroughly before re-pressing. CONTRIBUTOR No. 545.

EDITOR COTTON:

In answer to the inquiry of "Contributor No. 1045" regarding "water stains," sometimes called "dry marks," on his cloth, using the Utica Novelty and Mill Specialty Company's pipe dryer system, I would state that I have found these stains are caused by the heat of the metal pipe warming the wooden slats so that when any part of the fabric touching these slats dries out before the other parts, this mark will appear. Wetting out the cloth again will remove the marks.

The only way to overcome this trouble is to re-build the pipes so that there will be a layer of non-heat conducting material between the metal pipe and the outside slats, thus keeping the slats as cool as possible. Powdered asbestos is sometimes used, also a heavy layer of sheet asbestos is used to good advantage. These marks will be more pronounced on the dark shades. F. T. (N. Y.)

EDITOR COTTON:

This is in reply to your contributor who wanted to know how to eliminate water stains on his knitted fabric passing over the pipe dryer equipment of the Utica Mill Supply & Novelty Company. My suggestion would be that he jacket or insulate the approach or critical point—the place where the fabric hits the hot pipe first—by means of a water jacket, which will have a tendency to eliminate the sudden change in temperature and do away with these spots. I think he will find most of them to be shiny spots rather than water stains, exactly, caused by the sudden change in temperature affecting any moist places on the fabric. CONTRIBUTOR No. 544.

Variation of Stitches in the Ankle.

EDITOR COTTON:

This is in reply to the question of "Bob (Canada)." This question is difficult to understand, but I take it from his letter that he wants to know whether the courses per inch will be the same in 12 hose made on 12 machines, measuring and weighing the same—made on a Model K, using 3-thread pure silk over 150 denier rayon—or whether it is possible to get them all the same.

I have made stockings of this type on the Model K machine, making them on a greater number of machines without any difficulty in getting the stitches the same, unless there is a variation in the yarns, which of course would produce variation in the stitch. Twelve different stockings made on twelve different machines may be the same length, but this does not necessarily mean that the stitch is the same in all twelve stockings. Some of these hose may be a little tighter or looser in the boot of the hose, and vice versa in the ankle, whichever it may be, making up for the other; and still they might be all the same length.

If the hose made on a Scott & Williams K machine is knitted according to specifications with reference to the ankle and boot, the chains all being alike and with no variation in the yarns and with the proper mechanical

Auto-Lap
11800 BZ
5100
13100
G79000 B
for RAYON
Seaming - - - - - 15400 AP
Seaming - - - - 15400 AR
Hemming - - - - 15400 AQ
Shirring on Rayon Underwear - 16100 C-8
Attaching Lace to Bloomers - 17100 Z
Inserting 2 row Elastic and Hemming Bloomers - - 17100 Z-16
Hemming and Picoetta Stitching G79000 B
Felling on Rayon Underwear - 11800 BZ
Inserting Elastic and Hemming Bloomers - - - - - - - 7400 AG
Scalloping on Rayon Underwear G4500 Z
Attaching Split Tube Border to bottoms of Ladies' Undergarments 13100 C
Flat Seaming on Rayon Underwear - - - - - The Auto-Lap
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for KNIT GOODS
Stitching and Folding Button Stays and Buttonhole Facings - - - 16200 J
Stitching Collarettes to Knit Underwear - - - - - - - 5100 K
Seaming Cuffs to Knit Underwear 5100 H
Attaching Lace and Knitted Tubing to Underwear - - - - - - - 13100 A
Overedging on Knit Underwear 15400 D
Scalloping on Knit Underwear - G4500 Z
Flat Seaming on Knit Underwear - - - - - The Auto-Lap
Inserting Elastic and Hemming Bloomers - - - - - - - 7400 AG
Union
Special Machine Company
400 N. Franklin Street
Chicago
U. S. A.
4500 Z
15400
7400 AG
17100 Z
16200 J
16100 C-8

conditions on the machines, I can see no reason why they should not all be alike. "Bob" and any other readers can secure information with reference to the stitch in the ankle and boot and how to get it uniform, in the "Knitting Kinks" Hand Book No. 1, which the publishers of COTTON give as a free premium with a year's subscription to COTTON.

CONTRIBUTOR No. 542.

EDITOR COTTON:

I note the question of "Bob (Canada)" as published in the February number of COTTON. He wants to know if, on a Model K machine running three-thread silk over 150 denier rayon, regardless of the links in the chain, if the stockings measure exact and the weight of the hose is correct on twelve machines, does it prove that all ankles of the hose have the same tightness, or is there liable to be a difference in the courses per inch in some of the hose.

Having one or more chains on different machines with the same links does not prove that the ankles will be of the same tightness, but there should not be any more courses per inch to the whole length of the stocking, as the machine only makes so many courses to the link. There could be more courses to the inch in a tight ankle than in a loose one, but to get the same length stocking, the top and leg would have to be tightened. Therefore, you would have two stockings of the same length but knit differently, with the same amount of courses in them, all because the tensions were not set right. I would advise anyone with trouble of this kind to first watch the chains to see that they are all built alike, with all rocking links in them so as to throw the tension from the graduating cam to the foot tensions, as the ankle is supposed to be knit on the foot tensions. If these are all right, and he doesn't have the right fabric yet, then he should have his fixers adjust the stitch and sinker cams, at all times seeing that the left-hand end cam is as close to the stitch cam as it will run.

V. T. (TENN.)

EDITOR COTTON:

This is in reply to "Bob (Canada)" regarding the ankle of stockings made on the Model K, Scott & Williams machine.

To obtain the same tightness of ankles on stockings made on the K machine with the Scott and Williams graduating device, it would be necessary to have the same number of links in the chain for the foot of the stocking on each machine, as the length of the stocking over all does not indicate the tightness of the ankle. There is likely to be some variation on different machines on account of the cylinders not dropping properly. If the cylinder on each machine dropped properly and each machine had the same number of links in the foot, and all the feet were sized exactly the same, all the ankles would be the same tightness, or in other words, would have the same number of courses per inch.

N. F. (TENN.)

Kinks and Suggestions on the Model K Machine.

EDITOR COTTON:

In this, my second, letter on kinks and suggestions on Model K machines I am going to take up several more less minor but important details beginning with the stop motion.

The Stop Motion.

The stop motion is a very interesting subject. Some mills will have them installed on their machines and others will not.

There are many stop motions on the market today, some of them good and some not so good. I believe a stop motion to be a good thing, provided the proper kind is used for the various classes of yarns employed.

The purpose of a stop motion is to stop the machine when a knot or broken end passes through the stop motion. It should stop the machine before the broken end has a chance to get to the needles, and should be extremely sensitive. It should be adjustable for any kind of yarn and stop the machine the moment the slightest strain occurs on the yarn.

One advantage of a good stop motion is that it does not cut the ends of the yarn when the machine stops, but drops it off from the guide, and all that is necessary to re-thread the machine is merely to put the yarn back up on the guide. The resultant savings in waste which such stop motions effect will more than repay their cost.

The Cylinder.

Much can be done to preserve the cylinder in as good a condition as possible during its life. Of course this treatment all depends on several factors, namely, the class of work, the adjustment of the various parts which work in the cylinder, the expertness of the machinist or fixer who takes care of it, and the methods used in putting in new walls and the straightening of these walls.

When the breakage of the butts of the cylinder needles occur, as a general rule, these walls get bent to the side and need straightening. A wall should never be straightened by laying the point of the screw driver, or whatever it happens to be, against the bent wall and pounding on it until the wall is straightened. While this practice is common it results in the wall getting all nicked up, resulting of course in the needles not working freely. The needles should always be put in the slots above the bent portion, tapping the needle down until it is even with the bent portion, tapping lightly against the needle. This in turn takes the wall with it, leaving a smooth job.

Another common practice is where the fixer pushes the point of a screw driver into the slot and forces the wall apart.

Care should be taken not to have the stitch cam bracket rubbing the cylinder, or this will wear the outside portion and roughen it up. The guard cam, which is fastened to the right hand pick bracket, should be watched so that it does not rub the cylinder. The switch cam is another cause of grooves worn around the cylinder due to its fitting too closely. Oil should not be used too sparingly.

Inserting Walls.

There are several methods of inserting new walls in the needle cylinder. Following is one of the methods:

The tools necessary for doing this job should consist of two pieces of asbestos board, which is the best, although anything which is flat and will not burn, is suitable. These should be about six inches long by five inches wide, depending on the size of the vise being used; one wire brush which is fine enough to get into the slots of cylinder for scraping purposes and punches suitable for tapping the walls out of the cylinder when they are heated up.

First, tin the new walls which are to be inserted. This tinning is done by placing a very thin layer of solder on

the bottom of the wall. Use this solder sparingly, because if too much is put on, it will be hard to get the wall into its slot and the needle will work hard.

Second, insert the cylinder in the vise; place the pieces of asbestos board at each end of the cylinder and clamp. Particular attention should be given to see that this cylinder is not clamped too tightly, as damage to the slots of the sinker top will result.

Third, insert the flame of a blow torch inside of the cylinder, keeping this flame as far away from the top of the inside sinker ring as possible. This top is only soldered to the cylinder, and if the flame is allowed to hit it, the solder will of course melt and the top come off. Another disadvantage of having the flame too close to the sinker ring is the warping of this top, which makes it worthless for knitting. Hold the flame in just far enough to heat up the solder which holds the broken wall to the cylinder, which should be a matter of only a few seconds.

Fourth, when this has been done, use a punch for tapping the wall out toward the bottom of the cylinder. Immediately insert the newly tinned wall, taking the utmost care not to let the top of this new wall strike the inside sinker ring. If this should occur the sinker ring would be thrown out a trifle resulting later in a crooked stocking. Tap the wall up until it just misses the ring.

Fifth, now insert the flame again, just enough to soften up the solder.

Sixth, immediately take the wire brush scraper and brush hard, seeing that all the loose solder is gotten out. Then let the cylinder cool before evening up the surface of the walls inserted.

The Alarm Bell.

As every one knows, the purpose of the alarm bell is to have it ring when the machine breaks a needle. But many smashups have occurred due to the failure of this bell to ring, as fixers are aware. The welt presser and the bell work together, so if one or the other is not adjusted properly this trouble will result.

The welt presser is adjusted when the machine is on the splicing. At this part of the stocking the presser should be all the way in, just clearing the hooks of the cylinder needles. At this part of the stocking the bell should be moved around until it barely misses the rod of the welt presser.

Occasionally the bell gets out of adjustment due to the operator, when cleaning his machines, accidently moving the bell around slightly. The screws holding the bell to the bracket should be well tightened.

The Brush.

The function of the brush is to keep the latches open when the hose has dropped from the machine until the machine has started on another stocking.

Setting this brush is important. If all the latches are not kept open, when the machine starts on another stocking those that are closed will not take the yarn, resulting in throw-offs and cut-outs in the set-up. The brush should be set so that it just hits the needles, but not too low so that it hits the top of the sinkers, for when this occurs breakage of the latches of the needles will result. It must clear the tops of the sinkers.

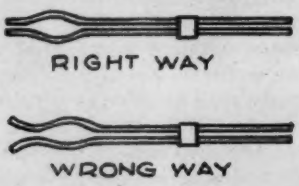
The bracket upon which the brush is mounted is adjustable, and this adjustment can be secured easily.

The Transfer Jack.

The purpose of the transfer jack is to transfer the stitch from the jack to the cylinder needles when transferring off the hem of the stocking. Every other needle is thrown out of action on both the set up and the transfer, while the jacks come out between the needles that are in action, taking the yarn and transferring the loops from the jack to the cylinder needles. It is advisable to put a trifle more tension on these jacks than they have when they come from the factory. This is necessary so that they will not work too freely.

It is also necessary to bend the point of the jacks inward a little so that the point will not be spread, as shown in the illustration.

When inserting the jacks in the slots of the dial, be sure that the jack is straight, not bent to one side, otherwise



they will break off or not transfer the loop properly. This is due to the narrow space between every other needle. All the later transfer jacks sent out from the factory will have numbers on the end of the jack. This is being done so that the various sizes of transfer jacks can be kept separate, or in case they are mixed, they can easily be told apart.

Chain Links.

The chain controls the length and the stitch of the hose. It is divided into sections, each section performing its part in the making of the stocking.

The changing links, or the links with a hump on the right side of the link, control the various changes from one part of the hose to the other. Every fixer knows that these changing links become worn in the course of time, resulting in the main pawl not dropping low enough to make the proper kick, and therefore causing trouble. These links should be put through a case hardening process before they are put in the chain layout, in order to save this wear and future trouble.

The spring which holds the rachet pawl lifter No. 6027, should not be too stiff, as this is another cause of undue wear.

The Pulleys.

A machine is equipped with three pulleys as follows: The high speed pulley No. 5500 is used for the high speed of the machine. The intermediate pulley No. 5502 used for slow speed and the loose pulley No. 5504 is used when the machine is stopped.

The high speed pulley is that upon which the belt operates when running the circular courses of the leg and foot. The intermediate pulley is the low speed pulley, and is actuated by the belt when making the heel and toe.

Very little trouble is had with these pulleys except the slot in the high speed pulley in which the high speed pulley brake lever stud operates becomes worn in time, and it is necessary to have this hole refilled and drilled out again, otherwise the screw will work out of the pulley, resulting in the machine not stopping when the yarn breaks or the needles pile up. The reason this slot becomes worn is due to the pounding which the pulley receives when the brake is thrown.

If the pulley clicks every time it makes a revolution, it indicates a strain on this point. If the operators do not

shut the machine off the moment it clicks, trouble will result.

The high speed pulley stop buttons No. 8340 become loose and worn in time, so it is worth while to check these over.

Further details will be taken up in a later letter.

CONTRIBUTOR No. 445.

Among the Knit Goods Jobbers.

The Sheibley Tyler Co., Philadelphia knit goods jobbers, organized more than 50 years ago, discontinued business on March 17, selling the entire stock of hosiery, underwear and sweaters to the Lit Brothers department store in that city. The company was, for a number of years, sole Philadelphia distributor of the Knoxville (Tenn.) Knitting Mills' lines, considerable of which had been sold for spring. Formerly a power among Philadelphia jobbers, the Sheibley Tyler Co. became a victim of the changed methods of distribution. President Sheibley says creditors are fully secured.

The knitting manufacturing trades are in receipt of a form letter from E. M. Stevens, of the Burnham-Munger Dry Goods Co., who as president of the Wholesalers Association of Knit Goods Buyers pleads for cooperation of manufacturers, urging them to distribute through jobbers to the exclusion of group buyers and chain stores. The wholesalers' possibility of profits is being cut into seriously by combination buying, he says in his letter. Some of the replies of manufacturers, it is disclosed, intimate that under the methods of the average wholesaler mills cannot be kept running steadily. They express a desire to maintain the most friendly relations possible with jobbers, but call for the same measure of cooperation on their part as they call for from mills.

A hosiery jobber approached a manufacturer a week or two ago with the appeal "want you to help me out." Asked to indicate the kind of help he wanted, the jobber, mentioning a rather important department store, said, "I have succeeded at last in putting your line in."

"That's fine," said the manufacturer, "but you haven't told me how I can help you."

"Well, you see," the jobber said, "I cannot put in the line right away because I do not have the goods. I want you to make a shipment right away."

Of course the shipment was made, but the manufacturer regarded the incident as indicating numbers of jobbers are selling short, as this one had sold. Turning to his file, he said, "I have had three orders from one jobber this week. I never knew jobbers to operate so conservatively while trusting to mills to have the goods that ought to be in their warerooms."

A jobber who employs 51 salesmen bought that many sets of samples of a mill line of children's hose in 12 numbers each, and at the same time placed an order for 360 dozens, which under ordinary circumstances, it is pointed out, would not be enough to fill the orders taken by one salesman in a day of normal selling.

Purchases of 50 pounds of dyed worsted yarns by a knitted outerwear manufacturer are not rare. But the explanation may be that mills are selling in relative quantity, for one, in Buffalo, N. Y., received an order from a retailer for one-twelfth of a dozen of boys' knitted caps. A Philadelphia department store sent a local mill an order

STANDARD KNITTERS

Children Want Fancy Stockings

With the growing demand for fancy stockings for children the hosiery manufacturer will find a welcome place for the Standard H Machine. This knitter with the attachment "C" will produce the horizontal stripes shown in the above fabric, which is in three colors. The vertical stripes are produced by the reversed plating method, or if desired a positive method of producing vertical stripes can be substituted.

Our catalog which contains a vast amount of valuable information for the mill owner will be sent you upon request.

STANDARD-TRUMP BROS. MACHINE CO., *Wilmington, Del.*

JAMES BUILDING, CHATTANOOGA, TENN.

"Best Service" Sizing Compounds
are made under careful laboratory control. All raw materials are bought on specification. Our finished products must meet our exacting standards. A trial order will convince you.
Burkhart-Schier Chemical Co.
Manufacturing Chemists for the Textile Industry
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Office and Warehouse, 1202-16 Chestnut Street
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CRITICAL knitters recognize Standard Mercerized Yarn as a leader in the Mercerized Yarn field.

This is because it offers more uniformity, strength, evenness and lustre.

Full value will only be appreciated through use on your machines.

STANDARD-COOSA-THATCHER CO.

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Canadian Representative:
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Toronto, Montreal

Standard

MERCERIZED YARNS

for one dozen pairs of infants' socks, which the manufacturer declined to fill, stating it might be safe to buy from hand to mouth but not profitable to sell that way.

Fidelity Acquires Thomas Pleating and Creasing Machines.

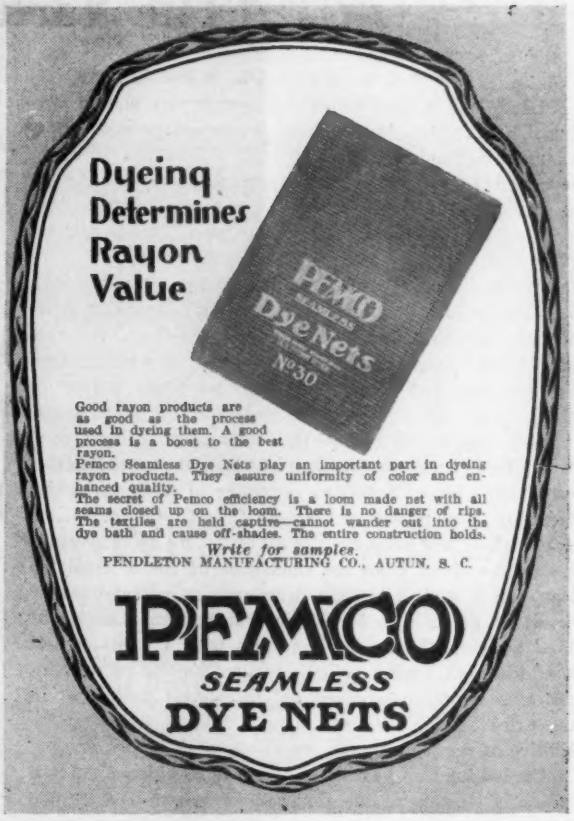
The Fidelity Machine Company, 3908 Frankford Ave., Philadelphia, has just announced the acquisition of the business of Fred Thomas, manufacturer of pleating and creasing machines. The improved line of Thomas pleating and creasing machines has been well known to the manufacturers of rayon garments, knitted outerwear, underwear, men's clothing, shirts, lumber jackets and overalls for many years, and aligned with the Fidelity organization the service will be well equipped. These machines, it is stated, are especially adapted for producing rayon shields, as well as

making a well-shaped uniform pocket, by means of a combination of heat and moist steam. Four pockets may be worked at a time, it is stated, resulting in a saving of labor.

McLain-Simpers Organization, Stock Exchange Building, Philadelphia, have taken over the advertising account of the textile division of Charles J. Webb & Co., Philadelphia, manufacturers of shower bath curtains, duck and canvas goods of every description.

An Interesting Book.

An interesting collection of scientific information on various textile subjects and allied fields has been made by F. P. Sheldon & Son, Providence, R. I., under the title, "Miscellaneous Scientific Papers of F. P. Sheldon & Son." The book consists of papers presented by members of this concern before various engineering and textile associations. The address on each subject represents exhaustive research and experimental work. Among the textile subjects covered are the effect of humidity, ring size and spindle speed on yarn; four and six roll drafting; four roll drafting applied to slubbers and roving frames; experiments in long drafting on the spinning frame; charts for determining the strength of yarn. Other subjects covered refer more particularly to building construction. Among the subjects of the remaining papers are heat transmission through various types of sash; the effectiveness of various types of roof; principles of sawtooth-roof design; preservation of decaying wood roofs; proper utilization of light of day in roof fenestration; bringing daylight through walls; and practical daylight calculations for vertical windows.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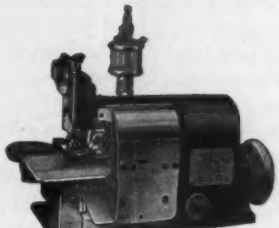
SEAMLESS
Dye Nets
No 30
Good rayon products are as good as the process used in dyeing them. A good process is a boost to the best rayon.
Pemco Seamless Dye Nets play an important part in dyeing rayon products. They assure uniformity of color and enhanced quality.
The secret of Pemco efficiency is a loom made net with all seams closed up on the loom. There is no danger of rips. The textiles are held captive—cannot wander out into the dye bath and cause off-shades. The entire construction holds.
Write for samples.
PENDLETON MANUFACTURING CO., AUTUN, S. C.
PEMCO
SEAMLESS
DYE NETS

MERROWING

Established 1838



HIGH SPEED TRIMMING AND OVERSEAMING, OVEREDGING AND SHELL STITCH MACHINES

For use on all kinds of knitted and woven fabrics.

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Reg. Trade Mark

Ask for details of our NEW STYLE 60ABB for simultaneously trimming and joining in a FLAT-BUTTED SEAM, the ends of cotton, woolen or silk piece goods for subsequent processes such as washing, bleaching, calendering, dyeing and printing, effecting substantial saving in labor and cloth.

Send us samples of your own fabrics to be seamed.

Quality and Quantity Production at Low Operating Cost

THE MERROW MACHINE COMPANY

16 Laurel St., Hartford, Conn., U. S. A.

The Yarn Market

Philadelphia, Pa., March 19th, 1927.

Conditions in the Philadelphia cotton yarn market during the past month have undergone comparatively no major changes in fundamental directions. There has been the usual shifting of levels from one group to another, so far as improvement is concerned, but no radically important developments that might be cited as being of any general character.

While during the previous similar period, yarns as a whole demonstrated a little better strength regarding price, the past month failed to materialize conditions that warranted any better situation in this respect. Up until March the new year had brought on somewhat better activity in the way of demand and purchases, but the improvement started along this line failed to continue during that month. Speaking in general terms, it might be said that the market eased off a bit, with nothing occurring to mark any major trend or development in the near future. Of course, the approach of new crop discussions and more definite analyses of the effect from the abundance of cotton from the last crop is tending to tighten up activity in that line, the result of which is to be felt in this market. Outside of that, however, the market continues with a small-lot and hand-to-mouth buying policy prevalent among its consumers, who appear determined not to interest themselves in the prices, which they say, would make their costs prohibitive of profit under the conditions of their own market.

Carded knitting yarns were perhaps considered the best individual feature of the transactions passed through this market during the past month. They seemed to hold up pretty well the stronger position developed for them previously, and as a general thing, perhaps, the prices paid were more satisfactory in this division than was the case with other groups.

Yarns for insulation purposes might be classed as running second to the knitting group in strength and demand.

Carded yarns for weaving purposes did not show comparable health, also they were affected by intermittent periods of activity. While this sporadic interest moved a quantity of stocks, still it was considered that the prices paid were not on a basis with those involved in the sales of carded yarns for the other classes of consumers.

In the face of the fact that textiles generally present possibly the most outstanding exception to the country's generally prosperous condition in other industrial and commercial fields of endeavor, improvement is anticipated in this market by experienced factors. In carded yarn circles, there is felt to be a large possible demand, coming not from territory adjacent to this city, but from mills outside of the state, who, it is understood, are more amenable to spinners' rates than are those closer by. The improved situation in the divisions which use these yarns, for example in plush circles, is looked upon to help the situation. Compared with other divisions of the market here, it was felt there possibly were more stocks in hand due to continued operation in the mills, which, it was declared, an improved situation would reduce for the health of the stock conditions.

For the past ten days or so up through this week, the combed yarn end of the market has been showing steady improvement in sales and increasing prices. This was attributed to the fact that the buying and selling ends have been sitting one another out, and that the spinners simply "out-waited" the buyers, who, at the same time, seemed more confident that the market had stabilized sufficiently to warrant buying actions on their part. In addition to these, a firm attitude was maintained by the spinners, to which a judicial curtailment before the turn of the year was believed to have contributed, relieving the possible burden of a market too over-stocked to permit the demand for replacement costs on yarns.

Philadelphia prices on March 16th follow:

Single Skeins.

4s to 8s	24½ @25	10s	25 @25½
12s	25½ @26	14s	26 @26½
16s	26½ @27	20s	28 @28½
24s	31 @31½	26s	32 @32½
30s	33 @33½		

Single Warps.

8s	25½ @26	10s	26 @26½
12s	26½ @27	14s	27 @27½
16s	27½ @28	20s	28½ @29
24s	33 @33½	30s	34½ @35
40s	43½ @44		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	24
8s and 9s 3-4 tinged tube	21 @22
8s 3-4 hard twist waste	20½ @21

Two-Ply Skeins.

8s	24½ @25	10s	25½ @26
12s	26 @26½	14s	26½ @27
16s	27½ @28	20s	28 @28½
24s	31 @32	26s	32½ @33
30s	34 @34½	40s	42½ @43

Two-Ply Warps.

8s	26 @26½	10s	26½ @27
12s	27 @27½	14s	27½ @28
16s	28 @28½	20s	28½ @29
24s	32 @32½	26s	33 @33½
30s	34½ @35	40s	43 @44

Frame Spun Carded Yarn on Cones.

8s	24	10s	24½
12s	25	14s	25½
16s	26	18s	26½
20s	27 @27½	22s	28 @28½
24s	29½	26s	30
30s	33	40s	40½ @41½
30s double carded	33 @33½	30s tying in	31 @31½

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	36 @37	20s	38 @39
24s	41 @43	30s	44 @46
40s	48 @50	50s	54 @56
60s	60 @65	70s	70 @75
80s	80 @85		

Single Combed Peeler Yarn on Cones.

18s	38	24s	41
30s	44	36s	46
38s	47	40s	49

Mule Spun Carded Yarn on Cones.

10s	29	12s	30
14s	31	16s	32
18s	33	20s	33½
24s	34	26s	35
30s	36	40s	45

Mule Spun Combed Peeler Yarn on Cones.

10s	38	12s	38½
14s	39½	16s	40½
18s	41½	20s	42½
22s	43½	26s	45½
28s	46½	30s	47½
36s	50	38s	53
40s	57		

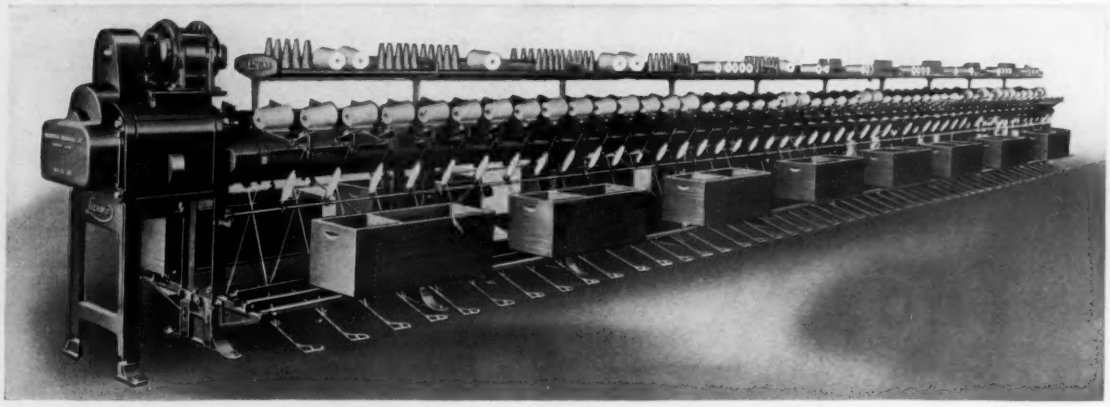
G. J. BENNETT has succeeded J. C. Ballard as superintendent of the Rhyne-Houser Manufacturing Co., Lincolnton, N. C. He was formerly superintendent of Mill No. 4, Marlboro Mills, Marlboro, S. C.

W. F. HOWARD, overseer of weaving, has been promoted to the assistant superintendency of the cotton mill at Pacific Mills, Lyman, S. C., following the resignation of P. A. Smith as superintendent.

D. T. BAGWELL has been made general superintendent of the Henrietta Mills, at Henrietta and Caroleen, N. C., and Cherokee Falls, S. C., succeeding John F. Scott, resigned.

G. R. COLLINS has become overseer of spinning at Chadwick-Hoskins Company, Pineville, N. C. He formerly held a similar position at the Santee Mills, Bamberg, S. C.

AN ACHIEVEMENT
SELDOM EQUALLED IN ANY INDUSTRY



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Moderate price, better than average quality, durability, high productive capacity, and low operating cost — these are the features that make for wide acceptance and general adoption of any mechanical device in any field. But *all* of the elements must be present. Not a single one must be obtained at the expense of another. If any one is lacking, the product automatically falls into comparative obscurity.

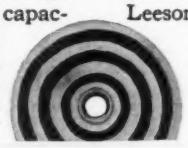
So seldom is a combination of *all* these features effected in any industry that its attainment is unusual,— a rarity.

In producing the No. 60GF Leesona Universal Winder we have attained the unusual. We have combined moderate price with better than average quality, durability, high productive capacity, and low operating cost.

This machine winds cones either for knitting or for shipping purposes; also for high-speed warping in a Leesona Universal Cone Creel.

Equipped with ball bearings, it requires less than 3 H. P. to operate 98 spindles at a yarn speed of from 450 to 600 yards per minute. Because of its high speed it requires less floor space for a given production than ordinary spoolers or winders. It has self-threading tension, foot start, and affords maximum convenience in doffing both supply spindle and product spindle. Materials and workmanship are in every way equal to the high standard which has always made Leesona stand for durability.

Whether your winding problem is coning, tubing, or something else, Leesona can offer the solution. Ask a Leesona sales engineer to call, study your requirements, and make recommendations. Your request will not obligate you. Use the coupon now.



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Two essentials to success in any business are a *clearly defined target* and an *unwavering aim*. A third of a century ago the Universal Winding Company established for itself, as a goal or target, "the solution of every winding problem." Since then this Company has built over 2,000,000 winding spindles and marketed over fifty different kinds of winding machines. Many of the originals are still the only outstandingly successful mechanisms of their kind on the market.

This Company is at present the largest organization in the world making winding machines exclusively. Supremacy in size is the logical result of supremacy in demand. Supremacy in demand follows leadership in conception, execution, materials, and service.

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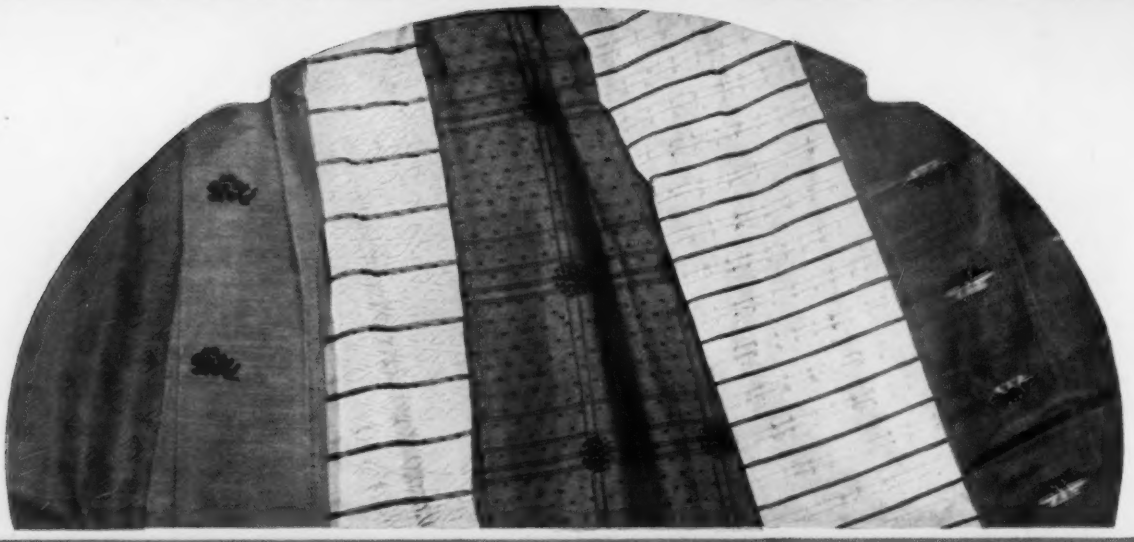

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"ROSBRO" Embroidered Silktone Fabrics, converted by Rossman Bros., New York City.

A FEW years ago shirts were a colorless, obscure part of the masculine wardrobe, and milady had only a few party frocks. Then came COLOR, and the demand for shirts and wash dresses increased by leaps and bounds. Young and old alike were attracted by the brighter, smarter effects of diversified and daring colorings, and bought accordingly.

To-day COLOR is the dominant factor determining the salability of shirtings and wash goods.

Turner & Vandam, Inc., converters of "Tee Vee" fabrics, and Rossman Bros., converters of "Rosbro" fabrics, have been very successful in creating popular stylings. It is significant that coincident with their success, they have made generous use of Franklin Process Colored yarns.

Is COLOR yielding you satisfactory sales and profits? We have made COLOR do this for many customers at surprisingly low cost because the Franklin Package reduces winding costs in the mill. We have also assisted many customers in finding a market for their products.

Given the opportunity, we can probably do as much for you. It will cost you nothing to investigate. Why not fill in and mail the coupon now?

A Franklin Package of Dyed Yarn.

It will deliver freely by rotation or over end.

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The possibility of increasing sales through the use of color interests us. Please mail us the complete story or have your representative call.

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The Knit Goods Market

The hosiery primary markets are fast recovering the ground lost just prior to and following the turn of the year. The month of March seems to have marked the beginning of the end of a protracted unsatisfactory session for manufacturers. Production and shipments appear more nearly balanced than in a long time, although there is evidence of lingering large lots of full fashioned silk short boot goods and stuff that had been made up to meet a price when competition was keenest. There is, however, a market for the ancient and unworthy, but at prices that spell a considerable loss for mills which went too far in trying to accommodate price buyers.

Perhaps the better index of the market uplift is supplied by the activity of seamless silk lines of well known standards, and it may be worthy of note that demand for seamless sprouted during the time full fashioned was somewhat dull, mills selling direct to retailers and those distributing through jobbers shared in the improvement alike. This cannot, however, be said of all manufacturing establishments. Hosiery that is made on the go-as-you-please practice still is having hard sledding, but the way for it is smoother than it was.

The February shipments of a Philadelphia mill selling to jobbers under no brand were 100 per cent greater than those for December, with January ahead of the last month of 1926. The mill turns off high grade fine gauge thread silk to welt, and the stocking sells in retail stores at one dollar. March sales were larger, measured in terms of cases, than February, improvement being still on the increase.

A southern mill selling to retailers under a nationally advertised brand has in the last few weeks gone forward by leaps and bounds in the shipments and the booking of new business. The management admit they are at a loss to account for the extraordinary spurt, and while they say they believe the seamless stocking has driven the entering wedge for a strong comeback, are careful to not permit elation to carry them into a production campaign that might have disappointing results.

The stronger demand for seamless hosiery developed during the buying generally for retailers' Easter sales. If this is to be interpreted as meaning that the seamless will share with full fashioned in the stimulus of preparation for the inauguration of the spring season selling, then it would appear that the better situation for the former is more than momentary. If, on the other hand, full fashioned manufacturers realize their ambition to supply a good all-around dollar stocking, the seamless will have to show for retailers more than the present liberal margin of profit on the seamless.

Obsolete lines of full fashioned silk are available for the dollar ticket, but the better stores are not using them. Hosiery that was purposely cheapened also is offered, much of it, however, having passed over the counter of a class of department stores which had to have something for a special sale. The exploiting of depreciated full fashioned is thought by some factors to have had something to do with the revival of interest in seamless hose.

While it was taken for granted that prices for rayon would be increased, there has been no eagerness on the part of distributors to contract for rayon hosiery in advance of the higher prices for the yarn. Nor did assumption by manufacturers that future lots of rayon would cost them more influence them to contract for anticipated needs. The one effect of the report of advances that were permitted to seep through the trade was to stiffen manufacturers' spines when hosiery buyers were trying to hammer down the values of what little they were buying.

Those who will be most affected by rayon advances are the manufacturers using rayon in combination with silk for women's seamless hose, in the production of which numbers of northern mills are being operated overtime, notwithstanding the clamor about lower labor cost in the South. A Central Pennsylvania plant making this type of hosiery is operating steadily from Monday morning to Saturday noon, being on a full 24-hour worktime schedule. The product is sold to jobbers. In Reading the Fisher Hosiery Mill, making Nightingale brand of hose, is running on full daytime and part night time schedule, in supplying its retailer clientele. Most of the seamless mills in Reading are not so busy as the Fisher, while in the full fashioned field practically all mills are on a capacity basis and have been for some time, several accumulating stock.

Any material increase in the cost of rayon would be seriously felt in Reading, where are produced more fancy half hose than any other northern city. The product is, chiefly, of goods to retail at a half dollar a pair, and consume considerable rayon for plaiting. Mills are well sold up of the popular price novelty socks, and there is heard complaint from jobbers that deliveries are not satisfactory. That some manufacturers are in arrears with shipments is admitted, but late deliveries can be charged to jobbers, who were late with their order details, with the result mills did not hesitate to sell direct to retailers, the jobbers thus losing out on some good business.

A good appearing pattern half hose is on the market for the 25 cent price bracket, and it is stated that socks designed for this price are even scarcer for spot delivery than are the half dollar sorts, often found ticketed 55 cents, two pairs for a dollar. One manufacturer of a half dollar number, made of rayon plaited on mercerized, also is producing a 25 cent sock, carrying the same patterns. The difference between the two is that one has mercerized top, heel and sole, while plain carded cotton yarn is used for the other. The 25 cent sock is reported a good seller.

A mill in Reading making fancy silk and rayon socks to sell at a dollar a pair is reported having detailed orders for deliveries through May. The mill also turns off higher price lines, which at the moment are not in volume production for any of several important establishments heard from. One manufacturer, selling under a brand to retailers, is shipping more of the 75 cent number than any other. Another manufacturer of high price novelty half hose reports business lagging except in his half dollar lines. While in a general way demand for novelty socks is well sustained, the market shows some light spots. Plain color silk half hose, as is disclosed on the street, has had a hard jolt from the fancies. Hope had been entertained that clocking and other embroidery might increase interest in plain colors, but seems to have almost vanished. There is, however, enough business to keep mills well known for their product running steadily at near capacity.

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RAYON YARNS

A Quality Product

Zehlendorf Viscose Rayon maintains the highest of standards. We invite your thorough tests. Zehlendorf Viscose Rayon will meet your most stringent requirements.

Fully diamond reeled with cotton tie-bands, Zehlendorf Viscose Rayon winds flawlessly. Fully bleached and with fine lustre, it dyes readily and evenly.

Adaptable to all rayon purposes.

Stock carried in New York.

Singles in A and B grades, regular and special twists for weavers, knitters and braiders.

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In spite of all that can be said of the better outlook for women's seamless silk and rayon in combination market interest is pretty well centered on the full fashioned field, where there is a well defined drift to finer gauge. In line with this program the Millheim Knitting Mills, an upstate Pensylvania establishment, will, it is understood, install 45 gauge machines in the mill which it has planned to start soon in Philadelphia. This presupposes that the company visions a protracted run for full fashioned chiffons, concerning which there is a marked division of opinion. Forty-two gauge is regarded the bread and butter full fashioned stocking, as was the 39 not so many years ago. Considerable of the 39 still is being produced. It is a good price proposition in times of stress such as the industry has experienced in quite recent months. And it is intimated the product of some 39 gauge machines is being sold as 42, which may be one explanation for varying prices for apparently comparable hose.

A Philadelphia manufacturer of seamless hose who last year installed 20 fine gauge full fashioned machines and proceeded to knit silk and rayon in twist has sold up his production for some months, and a few weeks ago announced a slight increase in the price for additional business. That he is satisfied with results is indicated in plans for additional installation, 10 more machines to be set up shortly, and 20 more a little later. It is said the stocking represents the nearest approach to a satisfactory silk and rayon yet produced on flat machines. But its cost precludes the probability of its going over the counter at a dollar a pair if distributed through jobbers. Another Philadelphia hosier has perfected a silk and rayon full fashioned for that price bracket. It will be sold to large retailers.

What would be the effect on pure thread silk hose in the full fashioned and seamless divisions if the combination yarn prove acceptable for medium weight goods as a dollar proposition is a matter of no little speculation in the trade. Production of seamless combination yarn for women increased over 50 per cent in January, making comparison with the previous month, according to reports from identical mills representing a large part of the hosiery industry, while the gain scored by pure thread silk seamless was negligible, amounting to less than one per cent. There was an indicated increase of more than 30 per cent in the output of full fashioned silk in January, comparing with the corresponding month of 1926. But it seems certain there will be no such spectacular gains in future months, as less new equipment will be installed this year.

Women's full fashioned hose, some factors say, is becoming as speculative as novelty half hose constantly undergoing kaledioscopic pattern changes. Questions uppermost in the fashioned field this spring relate to the future status of chiffons, heel construction, colors and length of silk boot, weight of fabric being also a matter of some doubt. Mills which had been making 8-thread hose of silk to welt have abandoned them for the time, several finding that weight of fabric in practically no demand, while having a fairly good market for 4-thread, but not calling for volume production.

Makers of hose having a heel of colors contrasting with those of the leg have had an enormous demand for spot delivery, the trade buying dangerously cautiously for future, however. Black heel on gun metal leg set a craze that has extended to light colors for both parts of the

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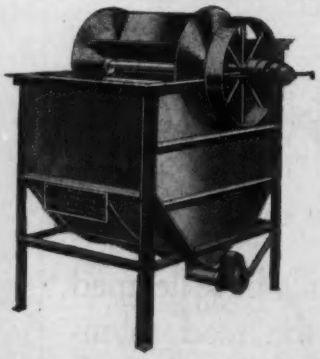

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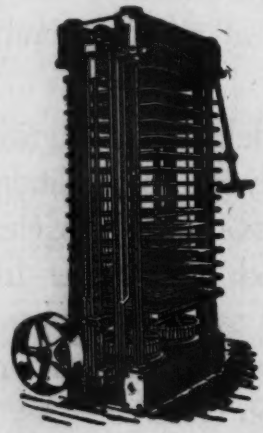

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stocking, although it appears the more lasting proposition will be in the tan group of colors. Woman wants contrast, for getting away from just plain hosiery, but wants it not too striking. Numbers of manufacturers, until last month, were adhering to the plain staples, but some of them admitted they had to provide for an increasing call for the parti-color stocking.

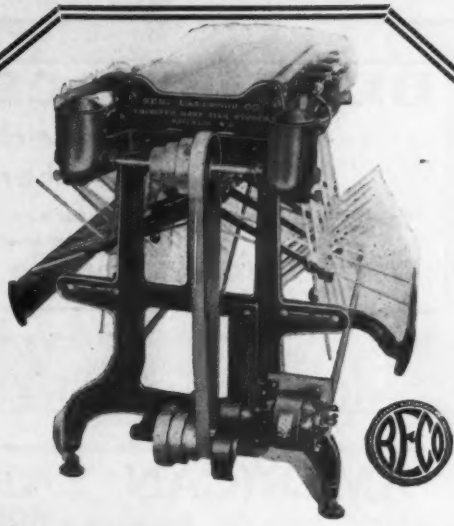
While 8-thread hose receded materially in demand, there seems a growing preference for 7-thread as a happy medium, and some small mills making no other number are operating overtime. One, in Reading, on a day and night schedule, is adding machinery, and by next month will have doubled production. The 7-thread silk to welt seems a favorite form of construction. Chiffons, on the other hand, must be of silk to top, and the top should be farther from the sole. A particularly exacting element in the trade calls for a 29 inch stocking. One manufacturer emphasizes the fact he is knitting 31 inches and gets a finished maximum length of 29½ inches, and the hose from this mill is of the full width of the machine head—14 inches.

Variations in construction often are overlooked by buyers when comparing prices of one mill with those of another. A buyer negotiating a week or two ago for 7-thread silk to welt hose complained the manufacturer's price was a half dollar a dozen higher than that of a competing mill, a sample of whose product he submitted. When the silk and the cotton in a stocking from each of the mills were separated it was found the higher priced contained 1 1/16 more ounces of silk than the other. In other respects, the stockings were as nearly identical as could be, coming from different mills.

The mill price to jobbers for a chiffon silk to welt was $13.25 a dozen, yet a buyer several weeks ago found a comparable stocking on sale in a retail store at $1.05 a pair. The explanation, it was found, lay in the fact the stocking shown by the retailer was an irregular, the defects, however, being hardly perceptible except upon closer inspection than usually is given by shoppers. This instance is cited as making it desirable that irregulars and seconds be branded for what they are, for the protection of the buying public and manufacturers who play the game with absolute fairness. Several mills, including among them some that are very widely known as direct-to-retailer sellers, used tell-tale marking for a time, and finally gave it up as an unprofitable practice.

Manufacturers say they can get a dollar and up more for a dozen irregulars that are not so marked as to make them readily distinguishable from perfect goods. Buyers specializing in lots assort their purchases and, it is stated, sell the more nearly perfect at a shading from regular prices, the remainder being taken by popular price shops and department stores for special sales in which seconds are featured. Some retail stores in ordinarily good repute will buy unmarked seconds and sell them as is. "We could not sell a second if it were marked as such," said a hosiery department manager, "but women who pass them up will buy low price hosiery which they should know is not, commercially speaking, perfect."

When once the trade shall have adopted certain standards and adhere to them, and let it be known their prices are fitted to the merchandise, this moot question of branding irregulars may be settled for a time, but, probably, not until then. It is up to buyers to discriminate and deal with their trade as fairly as they want to be dealt with by



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manufacturers. "We once believed jobbers would buy quality rather than price," says a manufacturer of strictly high grade silk who tried branding his seconds. "Now we know differently—that is, as to quite a number of buyers. But we still are going after the trade that haggles for quality rather than for a difference of a quarter or so in price. When we decide to make cheap hose we shall price it accordingly."

A somewhat tight situation in infants' socks was one of the market developments of a few weeks ago. Many small jobbers are short of the 25 cent fancy rayon socks, demand running especially strong in the plain color leg and fancy top class. Buyers were scouring the market and manufacturers were hearing from scattered distributors, some of whom were in communication with several mills, each of which received a begging letter from the same jobber. This was but one of a number of illustrations of unusual interest in infants' goods. Most of the mills in the more pretentious class had sold up to the end of May, and buyers were left to take what they previously had passed up.

Disappointed with their early spring sales last year, retailers had been slow to place orders this year, and many jobbers were operating accordingly, as were some mills, which accounts for the scarcity of spot goods when once demand became acute. Stiffening in prices of rayon may have been a factor in the sudden spurt in jobber interest. Whatever the explanation, the market for socks is in better shape than for some time, with demand equal to that in previous years along about springtime.

Activity is pronounced in all classes of children's hose, which now seems as much a problem as men's and women's. The full length stocking for misses continued in good call to the middle of March, and some primary market sellers say demand is about evenly divided as between the plain and fancy. Cancellations were received from a few scared jobbers, and these were welcomed by at least one manufacturer who had oversold. With the nearer approach to spring the seven-eighth length with fancy top came into better call, and this class now is showing much activity. Misses' jacquard hose at 50 cents to a dollar a pair have proved a fetching proposition, the lower price stocking leading the van in demand.

The improvement in the hosiery markets generally this year is shown in an indicated increase in new business and unfilled orders and a decline in the quantities in stock, finished and in the gray, as comparing with a year ago.

Underwear.

Modest advances in some few mill lines of men's heavy weight underwear seem a possibility, although hardly can be regarded a probability. Jobbers, it would appear, are making a market against themselves, in that they are slow to contract, those who, to March, had placed more than sample orders being in the minority. There was, however, some improvement manifest after announcement by the Mayo Sales Corporation of withdrawal of prices for deliveries January to May. The Mayo, selling agents for the Washington Mills, Winston-Salem, N. C., was the first to withdraw prices, a step that had the effect of influencing others to take like action.

Announcement of price withdrawal came close on the heels of a slight price cut by a New York State mill, although cotton had been steadily moving to higher ground, yarns commanding two to three cents more than when underwear was priced at the opening for the season. Something was needed to halt the price revision movement, and that something seemed to have been supplied by the Mayo Sales Corporation.

Although admitting prices at the start were amply low, numbers of jobbers declined to operate, having been encouraged by a few downward revisions to wait for further cuts. They took the position that, having named prices on cotton at around 12 cents, manufacturers could not afford to shut down their plants while waiting for distributors to come to market, as such a policy would increase their overhead cost and make for a shrinkage in their margin of profit, thin as it is. So, they felt, mills would have supplies, and as retailers are expected to pursue their dilatory tactics in relation to fall goods, the jobbers might as well do their buying later. Some said they realized they might have to pay higher prices as a penalty for procrastination, but still delayed, on the theory that it were better to be safe than risk being sorry. However, the heavy weight underwear situation showed improvement in March, and considerable activity is expected to develop in the primary market during April. Because late, orders should run fairly large.

Manufacturers, North and South, of nationally known lines, are the better situated as to orders in hand, but there has been some difficulty in persuading jobbers to supply details, without which orders were little more than an expressed intention, leaving manufacturers to shape their production campaign as best they might. Mills in the class referred to have booked a fair volume of business in some market centers, others lagging. In certain large cities, for example, a leading mill sold more cases, two to one, to March this year than in the first three months of 1926. Another, to the middle of the month, had contracted with all but an insignificantly few who bought last year. Still another reports bookings for fall very satisfactory, with details slow, but no doubt is entertained that within the next month there will be no delinquencies in this respect. Three or four mills might be mentioned as assured of a larger volume of business this year than last.

Price cutting now has been arrested and the market seems to have recovered from the jolt inflicted when a Tennessee mill came out a month and more ago with a substandard line intended to pacify jobbers looking for price. It soon came to be questioned in the trade whether the move was a wise one. It may have helped the mill that launched it, but the effect on jobbers generally and, in sequence, on mills at large, was disturbing. But that is a matter of the past, and the jogging of recent months has given way to a pace more nearly approaching a quickstep. from now on the market should be in manufacturers' favor, and where prices were reduced in a fit of impatience, original quotations seem likely to be restored.

Men's knitted light weight underwear of modern construction and carrying rayon trim is considerably more active, with much buying remaining to be done. Orders from the vast army of small retailers have been running late and light, and the duplicate business of many jobbers has not yet reached mills. It will increase in volume as retailer sales get their customary spring and summer start. The P. H. Hanes Knitting Co. is reported already sold well up of their fine gauge combed line of union suits which will pass over the counter at $1.50 per suit. The company has also a dollar suit that is being freely taken in the good

trade. Manufacturers generally of the one time popular balbriggan suit agree it no longer is used as establishing a price basis; that the market is absorbing more of the better garments and to a great extent ignoring the bals as they once held sway in man's summer underwear.

Branded lines of nainsook athletic underwear have gone into distribution in perhaps larger volume than last year, while the unidentified seems not to have been booked up so freely. This may be attributed in part to keener competition in the branded and more intensive merchandising policies of manufacturers. In fact, merchandising organizations which are credited with superior ability in the movement of goods are credited also with having had the cream of this year's business in all classes of underwear.

Reports from representative manufacturers of women's cotton light weight underwear are to the effect their sales show no decline, comparing with last year, notwithstanding there is an admitted further drift to rayon and silk, more particularly the former. Rayon has made amazing strides as an underwear fabric. Cheapened rayon garments are pretty well bowled out, and little complaint is heard of the average present construction, say jobbers and retailers. Rayon, it is coming to be believed, will prove a more powerful rival of silk than of cotton. There always will be sale for women's cotton vests and union suits, say primary market operators who also are distributors of rayon lines. Upstate Pennsylvania manufacturers of the cotton are, apparently, fairly well supplied with light weight business and have taken some fall orders for medium weights.

Sweaters.

Knitted outerwear has moved into a better position only because of the gradual shortening of the time remaining in which jobbers must do their shopping for fall. Prices are steadier, and some business in sweaters is being placed, and enough interest manifested to encourage manufacturers to believe that if the market suffers no further disturbance they will fare at least as well as they did last year, when the bulk of their production was crowded into the late months.

Conditions look fairly rosy for shaker coats, but there is a feeling that the lumberjack, the bane of knitted outerwear interests, will come to the front. This had not been expected, but recently the lumberjack began to attract more attention, and some of those making this type of work coat look for it to regain all of the popularity it lost in 1926. But it appears the lumberjack would have to be forced to give it any great standing as a competitor this year of the knitted coats, and some important distributors will be slow to put it in their lines.

A possibly more disturbing garment from the viewpoint of sweater manufacturers is the fleece lined coat, a new line of which recently was put on the market at a half dollar a dozen less than the standard price for this type of garment.

Manufacturers of women's spring and summer sweaters featured by retailers are quite well situated, shipments absorbing the production of a few mills. Jobbers do not give much attention to women's sweaters for the light weight season, and the bulk of their sales of winter numbers are in men's lines. Featured coats for men and boys are in right good demand from manufacturers whose product is distributed under advertised brands and through selected jobbers.

The sweater trade as a whole cannot be said to be busily engaged. There are, however, mills in which capacity operation is being maintained and no stock being accumulated. Most mills so situated are manufacturing only for orders. Practically none, according to present plans, will have any carryover at the end of the year, and few will be in position to accept any great volume of late rush delivery orders.

Trading in bathing suits is a trifle more active than a month ago, but memories of disappointments suffered in the spring and summer of 1926 cause merchants to proceed so cautiously with their commitments that there is a strong possibility the market will be minus when eventually they come along for spot goods.

Suggestions in Fancy Hosiery.

Some unusual possibilities for knit goods have opened up with the introduction of the two-toned stockings put out by well known firms. One manufacturer claims that women are looking for sensational changes and ideas and this new one appears to have struck their fancy.

While all mills are not producing these two-toned stockings having the "black" heel extending quite high up at the back, making a striking contrast, many are considering such novelties, the acceptance of black combined with any and all colors has opened up a new line, which will include the brown, blue, green, navy, gray, and taupe heel with the lighter shades of blue, gray, tan, yellow, etc., while one factor ventured the opinion that before the summer season was over we would see light shades combined with a dark red, which could be used effectively for sports wear.

The heel promises to be exploited that will match the dress, although stockings are likely to also match costumes, but will have the dark heel, which is claimed to have been presented to save splashed heels, particularly in wet weather, when the mud or water splashes onto the light stockings, much to the discomfort of the wearer from the standpoint of looks.

Because of the numerous novelties presented by the trade, sellers are inclined to believe that plain garments will be more generally preferred, but each month sees new fancies of some sort.

One house features a metal color jacquard, although it was not generally believed to be a good number because it would have a tendency to make the ankle appear larger than it really is.

Upper sections are being decorated and to save one the necessity of wearing garters a house is planning to launch a type printed in garter designs in striking contrasts. Because of the popularity of black and white, one pattern shows the fancy band edged with white and having a decoration in form of a floral motif at the side.

Whether or not such novelties will be accepted has not yet been determined, but it is believed they will strike the fancy of the ultra fashionable if produced in good grades.

Butterflies, embroidered in their natural colors, are also making their appearance at the top of clocking in some of the fancies.

Takes Over Publicity Work.

McLain-Simpers Organization, Stock Exchange Buildinging, Philadelphia, have taken over the advertising account of the textile division of Charles J. Webb & Co., Philadelphia, manufacturers of shower bath curtains, duck and canvas goods of every description.